2012 Air Quality Updating and Screening Assessment for Armagh City and District Council

---

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

May 2012

Local Authority Officer	Christopher Coyle
Department	Environmental Health
Address	The Palace Demesne, Friary Road, Armagh, Co Armagh
Telephone	07917 133627
e-mail	c.coyle@sgehc.com
Report Reference number	ARMAGHUSA2012
Date	May 2012

Executive Summary

Monitoring at 12 locations within Armagh City and District Council's area has demonstrated that there are 3 sites where NO_2 levels exceed the objective limit of 40ug/m^3. All of these sites are within current AQMA's and therefore, based on the results for 2011, the council **will not** be revoking any of the current AQMA's.
No sites outside of the AQMA's exceeded the air quality objectives for any pollutants.

This Updating and Screening Assessment of air pollution in Armagh City and District concludes that no detailed assessments are required for any pollutants at any of the sites monitored during 2011.

Following approval of the AQMA declaration for Greenpark Terrace in Armagh, the next step required by the Council is to submit an AQMA Action Plan for this site. This action plan should be completed by the end of 2012.

Table of contents

List of Tables

Appendices

1 Introduction

1.1 Description of Local Authority Area

Armagh City and District is located in the geographical heartland of Northern Ireland, a beautiful rural, historic area served by the main motorway network in Northern Ireland, with major road links to the business capitals of Belfast and Dublin. Armagh City and District does not have a high level of heavy industry. The majority of the local work force is employed in the delivery of services such as local government, education authority, health and social services, retail and agriculture. Although there are a number of quarries providing graded stone & gravel as well as road-stone coating. The greatest contribution to air quality pollution in the district is from road traffic. Particularly in the city centre where the road network is quickly reaching it's maximum capacity due to the increase in car ownership. Given the size of the rural hinterland surrounding the city of Armagh, public transport resources are stretched and the reliance on the motor car is greatly exacerbated. Armagh City is regarded as a route hub to the border with the Republic Of Ireland and is main through-route between mid-Ulster and the south east of Northern Ireland and hence has a traffic flow higher than that which could be created by local traffic alone. Particulate Matter (PM_{10}) and NO_2 would be considered as the pollutants most at risk of breaching the objective limits in Armagh as a result of road traffic. Armagh City and District Council has already declared an AQMA in January 2009 for NO_2 on Railway Street, Lonsdale Road, Mall West and Barrack Street. The 2011 Progress Report submitted by the Council concluded that a Detailed Assessment was required as a result of the objective limit for nitrogen dioxide being exceeded at Greenpark Terrace in Armagh. The Detailed Assessment was submitted in July 2011 and concluded that an AQMA would be declared at Greenpark Terrace. The Council is currently in the process of approving the declaration.

Domestic fuel usage throughout the District has historically been based on solid fuel but, as with the province generally, the use of coal is declining.

1.2 Purpose of 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.

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report should provide an update of any outstanding information requested previously in Review and Assessment reports.

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 $\mu g/m^3$	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 (PM_{10}) (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

Table 1.2 Previous Reviews and Assessments completed by Armagh City and District Council

Report Type	Date	Exceedences	Detailed Assessment Required	AQMA's Declared
Initial Review and Assessment	Jan 2001	None	No	None
Progress Report	April 2005	None	No	None
Updating & Screening Assessment	April 2006	None	No	None
Progress Report	April 2007	None	No	None
Detailed Assessment for NO_2	Nov 2007	None	No	None
Progress Report	April 2008	NO_2	No	Yes
Updating & Screening Assessment	April 2009	NO_2	No	In the previous year
Progress Report	May 2010	NO_2	Yes	None
Progress Report	May 2011	NO_2	No	Yes

Figure 1.1 Map of AQMA Boundaries (if applicable)

See Appendix D

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Armagh has one automatic monitoring station located in the district. This is at Lonsdale Road in Armagh City and monitors PM_{10} and NO_2 emissions. (This site is also a co-location site for NO_2 diffusion tubes). In September 2010 the PM10 analyser was upgraded to FDMS standard. In February 2012, Defra and Bureau Veritas approved an upgrade to the NO2 automatic analyser. The new analyser was installed by Casella engineers in March 2012.

Calibrations are carried out on a fortnightly basis and are completed by the Council's Air Quality Management Officer under an annual contract from Bureau Veritas. Site audits are completed twice per year by AEAT on behalf of Defra.

The Council also has a maintenance contract with Enviro Technology Plc for twice yearly inspections of the monitoring equipment and also facilitate 24 call outs for emergency maintenance.

Data from the automatic analysers is downloaded via modem by AEAT and Bureau Veritas. AEAT has responsibility for the management of the emissions data recorded by the monitors and they also complete all validation and ratification procedures.

Figure 2.1 Map(s) of Automatic Monitoring Sites (if applicable)

See Appendix C

Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	X OS GridRef	Y OS Grid Ref	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 location represent worst-case exposure?
Lonsdale Road	Roadside	-	-	PM_{10} & NO_2	Y	FDMS (PM_{10})	Y (2m)	3m	Y

2.1.2 Non-Automatic Monitoring Sites

During 2011 Armagh City and District Council carried out monitoring of NO_2 with diffusion tubes at 12 sites within the city. (This was reduced from 16 to 12 sites in September 2010 in order to facilitate triplicate monitoring at sites were a detailed assessment was required). The NO_2 diffusion tubes were prepared and analysed by Harwell Scientifics Limited. The tubes are prepared by coating the grids in a 50% v/v solution of the absorbent, triethanolamine (TEA) in Acetone. Analysis is carried out using a colorimetric technique.

One site at Lonsdale Road is co-located with an automatic NO_2 analyser. Details of the monitoring sites are given in Table 2.2.

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

See Appendix C

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 ?
Lonsdale Road (x3)	Roadside	H 876 458	NO_2	Y	Y (20m)	3m	Y
Mallview Terrace (x3)	Roadside	H 879 452	NO_2	Y	Y(<1m)	4m	Y
1 Barrack St	Roadside	H 879 450	NO_2	Y	Y(<1m)	2m	Y
11 Desert Lane	Urban Background	H 865 457	NO_2	N	Y(10)	2m	Y
19 Folly Lane	Urban Background	H 882 458	NO_2	N	Y(<1m)	1.5m	Y
1 Green Park Terrace	Roadside	H 873 447	NO_2	N	Y(<1m)	2.5m	N
80 Railway Street	Roadside	H 875 459	NO2	Y	Y(20)	2m	Y
20 Victoria St	Roadside	H 881 452	NO2	N	Y(<1m)	4.5m	Y
3 Barrack Hill	Roadside	H 881 451	NO2	N	Y(<1m)	2m	Y
44 Barrack Hill*	Roadside	H 884 452	NO2	N	Y(<1m)	2m	Y
Cathedral Terrace	Roadside	H 873 456	NO2	N	Y(<1m)	3m	Y
Dawson Street	Roadside	H 874 454	NO2	N	Y(<1m)	1m	Y

2.2 Comparison of Monitoring Results with AQ Objectives

2.2.1 Nitrogen Dioxide

The NO_2 monitoring site is located at Lonsdale Road in Armagh City. The site is on a main road which passes through the centre of Armagh. The inlet of the NO_2 monitor is located approx 3m from the kerbside. The nearest relevant exposure is approx 15-20 metres from the sampling site. Whilst monitoring results for this location have never exceeded the objective levels for NO2, the site is included within an AQMA as it is located between two other locations that have exceeded the objective limits. Lonsdale Road is joined at both ends by Railway Street and Mall West and therefore the action plan required to address these other AQMA areas would inevitably need to incorporate Lonsdale Road. The data capture for this site was 99% for 2011and the NO_2 annual average is 26 µg m^{-3}.

Automatic Monitoring Data

See Tables 2.3 & 2.4 below.

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

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring %[a]	Valid Data Capture 2011 % [b]	Annual Mean Concentration μg/m^3				
					2007*[c]	2008* [c]	2009* [c]	2010* [c]	2011 [c]
Lonsdale Road	Roadside	Y	99	100	25	26	N/A	26	26

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)
[c] Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.
*Annual mean concentrations for previous years are optional.

Table 2.4 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 2011 % [b]	Number of Exceedences of Hourly Mean (200 μg/m^3)				
					2007*[c]	2008* [c]	2009* [c]	2010* [c]	2011 [c]
Lonsdale Road	Roadside	Y	99	99	No Data	No Data	0	0	0

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)
[c] If the period of valid data is less than 90%, include the 99.8th percentile of hourly means in brackets
*Number of exceedences for previous years are optional.

Diffusion Tube Monitoring Data

During 2011 Armagh City and District Council carried out monitoring of NO_2 with diffusion tubes at 12 sites within the city. The NO_2 diffusion tubes were prepared and analysed by Harwell Scientifics Limited. The tubes are prepared by coating the grids in a 50% v/v solution of the absorbent, triethanolamine (TEA) in Acetone. Analysis is carried out using a colorimetric technique.

One site at Lonsdale Road is co-located with an automatic NO_2 analyser. Details of the monitoring sites are given in Table 2.5.

Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes in 2011

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2011 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.84
								2011 (μg/m^3)
1	Lonsdale Road (x3)	Roadside	Y	Triplicate and Collocated	100%	N/A	Y	30
2	Mallview Terrace (x3)	Roadside	Y	Triplicate	100%	N/A	Y	43
3	1 Barrack St	Roadside	Y	-	100%	N/A	Y	36
4	11 Desert Lane	Urban Background	N	-	100%	N/A	Y	13
5	19 Folly Lane	Urban Background	N	-	100%	N/A	Y	13
6	1 Green Park Terrace	Roadside	Y	Triplicate	100%	N/A	Y	49
7	80 Railway Street	Roadside	Y	Triplicate	100%	N/A	Y	50
8	20 Victoria St	Roadside	N	-	100%	N/A	Y	28
9	3 Barrack Hill	Roadside	N	-	100%	N/A	Y	32
10	Abbey Street	Roadside	N	-	100%	Y	Y	33
11	Cathedral Terrace	Roadside	N	-	100%	N/A	Y	21
12	Dawson Street	Roadside	N	-	100%	N/A	Y	23

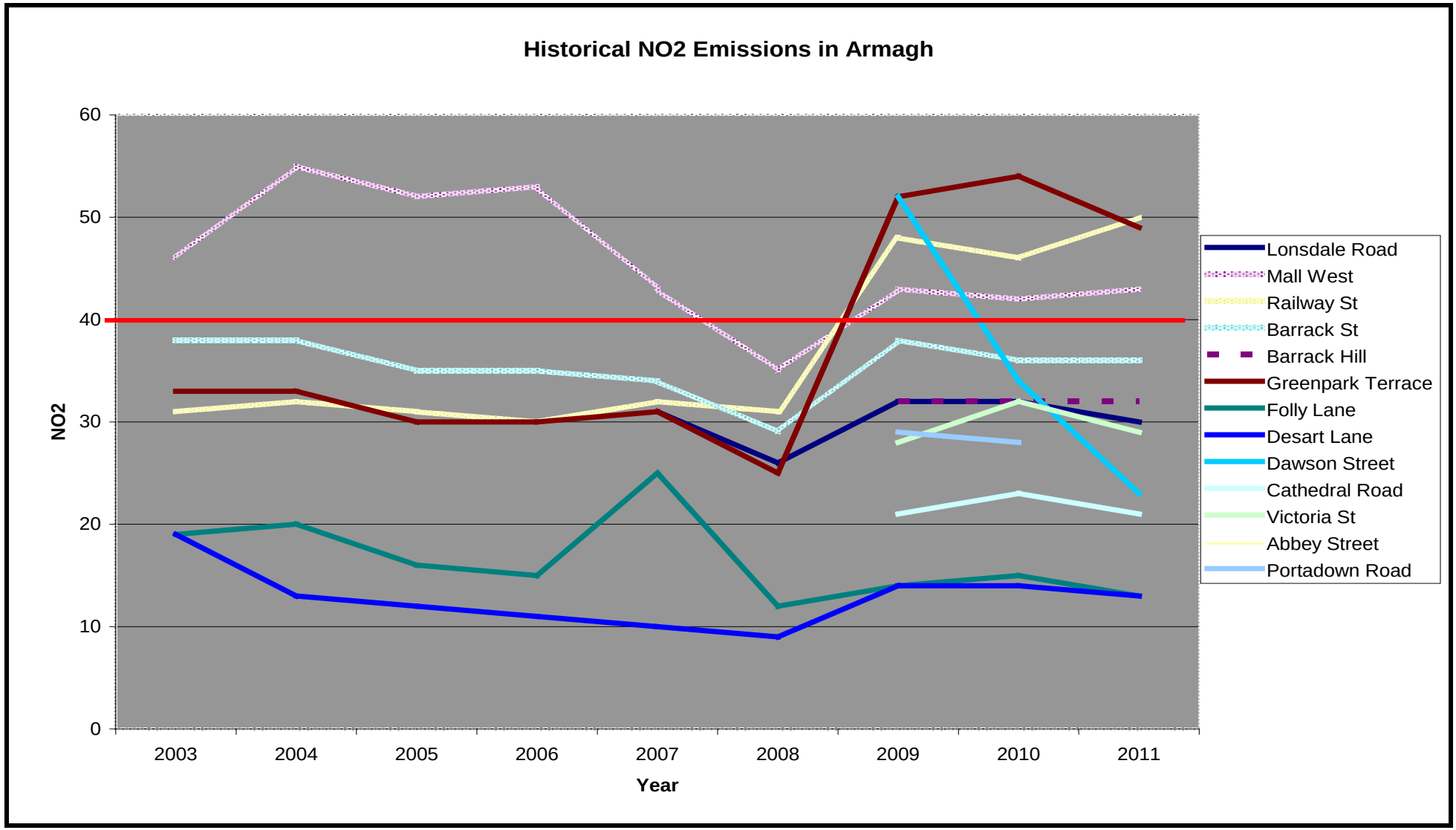
[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)
[c] Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.
*Annual mean concentrations for previous years are optional.

Table 2.6 Results of Nitrogen Dioxide Diffusion Tubes (2007 to 2011)

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) μg/m^3				
			2007* (Bias Adjustment Factor = 0.79	2008* (Bias Adjustment Factor = 0.62	2009* (Bias Adjustment Factor = 0.81	2010* (Bias Adjustment Factor = 0.81	2011 (Bias Adjustment Factor = 0.84
Lonsdale Road (x3)	Roadside	Y	31	26	32	32	30
Mallview Terrace (x3)	Roadside	Y	**43**	35	**43**	**42**	**43**
1 Barrack St	Roadside	Y	34	29	38	36	36
11 Desert Lane	Urban Background	N	10	9	14	14	13
19 Folly Lane	Urban Background	N	25	12	14	15	13
1 Green Park Terrace	Roadside	Y	31	25	**52**	**54**	**49**
80 Railway Street	Roadside	Y	32	31	**48**	**46**	**50**
20 Victoria St	Roadside	N	-	-	28	32	28
3 Barrack Hill	Roadside	N	-	-	32	32	32
Abbey Street	Roadside	N	-	-	-	-	33
Cathedral Terrace	Roadside	N	-	-	21	23	21
Dawson Street	Roadside	N	-	-	**52**	34	23

*Optional

Figure 2.3 Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites



2.2.2 PM_{10}

The PM_{10} monitoring site is located at Lonsdale Road in Armagh City. The site is on a main road which passes through the centre of Armagh. The inlet of the PM_{10} monitor is located approx 3m from the kerbside. The nearest relevant exposure is approx 15-20 metres from the sampling site. The PM_{10} unit was upgraded to an FDMS inlet in September 2010. Whilst monitoring results for this location have never exceeded the objective levels for PM_{10}, the site is included within an AQMA as it is located between two other locations that have exceeded the objective limits. Lonsdale Road is joined at both ends by Railway Street and Mall West and therefore the action plan required to address these other AQMA areas needed to incorporate Lonsdale Road in to the AQMA. It must also be noted that the declaration of the AQMA was made as a result of NO_2 exceedences at Railway Street and Mall West. No AQMA has been declared for PM_{10} in Armagh at this date.

The data capture for this site was 97% for 2011and the PM_{10} annual average is **19 µg m^{-3}**.

Table 2.7 Results of Automatic Monitoring of PM_{10}: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %[a]	Valid Data Capture 2011 %[b]	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration μg/m^3				
						2007*[c]	2008* [c]	2009* [c]	2010* [c]	2011 [c]
Lonsdale Road	Roadside	Y	97	97	Y	No Data	26	27	32	19

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)
[c] Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.
* Optional

Table 2.8 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 %[a]	Valid Data Capture 2011 %[b]	Confirm Gravimetric Equivalent	Number of Exceedences of 24-Hour Mean (50 μg/m^3)				
						2007*	2008*	2009*	2010*	2011
Lonsdale Road	Roadside	Y	97	97	Y	No Data	10	17	49	15

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)
[c] if data capture is less than 90%, include the 90th percentile of 24-hour means in brackets
* Optional

2.2.3 Sulphur Dioxide

Armagh City and District Council is not required to monitor Sulphur Dioxide.

2.2.4 Benzene

Armagh City and District Council is not required to monitor Benzene.

2.2.5 Other pollutants monitored

Armagh City and District Council is not required to monitor any other pollutants.

2.2.6 Summary of Compliance with AQS Objectives

Armagh City and District Council has examined the results from monitoring in the district. Concentrations outside of the AQMA are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

There have been no significant road building projects within the district since the previous rounds of review and assessment. The Department Of Regional Development Roads Service has stated that due to the reduction in financial budgets it is unlikely to be funding the by-pass roads that where previously proposed to circumnavigate Armagh City in order to relieve traffic congestion and the burden of road traffic pollution.

Armagh City and District Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

Armagh City and District Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

3.3 Roads with a High Flow of Buses and/or HGVs.

Armagh City and District Council confirms that there are no new/newly identified roads with high flows of buses/HDVs.

3.4 Junctions

Armagh City and District Council confirms that there are no new/newly identified busy junctions/busy roads.

3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

There have been no significant road building projects within the district since the previous rounds of review and assessment. The Department Of Regional Development Roads Service has stated that due to the reduction in financial budgets it is unlikely to be funding the by-pass roads that where previously proposed to circumnavigate Armagh City in order to relieve traffic congestion and the burden of road traffic pollution.

Armagh City and District Council confirms that there are no new/proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

In 2011 DRD Roads Service opted to re-open Abbey Street in Armagh City Centre to one way traffic heading up towards the junction with Dawson Street and Upper Irish Street. Whilst there would appear to be a rise in traffic levels on Abbey Street, the level of traffic is significantly below 5000 vehicles per day. The Council opted to set up a permanent diffusion tube monitoring location at the Façade of a house on Abbey street. Diffusion tube monitoring for 2011 covered a 6 month period from June to December during 2011. The annualised average for this location is 33 $\mu g/m^3$, which is below the objective limit of 40 $\mu g/m^3$.

Armagh City and District Council has assessed new/newly identified roads with significantly changed traffic flows, and concluded that it will not be necessary to proceed to a Detailed Assessment.

3.7 Bus and Coach Stations

There is one bus station in Armagh City at Lonsdale Road and this is the largest station in the district. Bus movements at this station are way below 2500 movements per day and therefore further assessment is not necessary.

Armagh City and District Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

There are no airports in the district or in any of Armagh's neighbouring council areas. The closest Airport to the Armagh district is Belfast International Airport near the town of Antrim which is 27 miles directly north west of Armagh City. The airport is 18 miles from the closest boundary point of the district.

Armagh City and District Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

There are no train stations serving the entire Armagh City and District area.

4.2.1 Stationary Trains

There are no train stations serving the entire Armagh City and District area.

Armagh City and District Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

4.2.2 Moving Trains

There are no train tracks, sidings or depots serving the entire Armagh City and District area.

Armagh City and District Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 Ports (Shipping)

There are no shipping ports within the Armagh City and District area. The nearest port is at Warrenpoint in the Newry and Mourne District Council area which is 23 miles to the south east of Armagh and is 14 miles from the nearest boundary with the Armagh district.

Armagh City and District Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out

Armagh City and District Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.1.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced

Armagh City and District Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

Armagh City and District Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.2 Major Fuel (Petrol) Storage Depots

There are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

Armagh City and District Council confirms that there are no petrol stations meeting the specified criteria**.**

5.4 Poultry Farms

Armagh City and District Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

Armagh City and District Council confirms that there are no biomass combustion plant in the Local Authority area.

6.2 Biomass Combustion – Combined Impacts

Armagh City and District Council confirms that there are no biomass combustion plant in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

Armagh City and District Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

Armagh City and District Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

Monitoring at 12 locations within Armagh City and District Council's area has demonstrated that there are 3 sites where NO_2 levels exceed the objective limit of 40ug/m^3. All of these sites are within current AQMA's and therefore, based on the results for 2011, the council **will not** be revoking any of the current AQMA's.
No sites outside of the AQMA's exceeded the air quality objectives for any pollutants.

8.2 Conclusions from Assessment of Sources

The greatest impact on air pollution at all sites monitored is from road traffic. Source apportionment derived from research completed during the current AQMA's demonstrated that road traffic accounts for over 85% of the pollution within Armagh City. There are no other sources that contribute to such high levels of pollution in Armagh, such as industry, agriculture or construction.

8.3 Proposed Actions

This Updating and Screening Assessment of air pollution in Armagh City and District concludes that no detailed assessments are required for any pollutants at any of the sites monitored during 2011.
Prior to the submission of this report, the Council made one change to the monitoring programme by moving the diffusion tube from Folly Lane to Greenfields Way in Armagh. It was assessed by the air quality management officer that the diffusion tube location at Folly Lane did not best represent an Urban Background site. The officer lost confidence in the site as the road is not exclusively used to service access to residential properties as it is utilised by buses; as an access to a sports and leisure centre and often used by a mixture of vehicles as a short cut in order to avoid traffic congestion in close proximity to the town centre. Greenfields Way is a more appropriate location as the road services residential traffic only and is not a 'through

road'. The tube is located on a lamp-post 1 metre from the kerb and approx 7 metres from the façade of No.25 Greenfield Way.

Following approval of the AQMA declaration for Greenpark Terrace in Armagh, the next step required by the Council is to submit an AQMA Action Plan for this site. This action plan should be completed by the end of 2012.

9 References

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

Appendices

Appendix A: QA/QC Data

Appendix B: DMRB Calculations

Appendices may include maps, tables, lists of processes etc. Include as many as necessary.

DELETE THIS INSTRUCTION BOX BEFORE SUBMITTING THE REPORT.

Appendix A: QA:QC & Wasp Data

Factor from Local Co-location Studies (if available)

Due to various works being completed at the Lonsdale Road site during 2011, the Council opted not to use a bias factor derived from the co-located tubes at Lonsdale Road.

Diffusion Tube Bias Adjustment Factors

The NO_2 diffusion tubes were prepared and analysed by Harwell Scientifics from the beginning of April 2011. This laboratory takes part in the NO_2 Network QA/QC Field Intercomparison survey. Harwell Scientifics diffusion tubes are prepared by coating the grids in 50% TEA in Acetone. Armagh City and District Council obtained the appropriate bias factor from Defra's LAQM Website. A factor of 0.84 was taken from the drop down menus available on the excel spreadsheet matrix.

Discussion of Choice of Factor to Use

Armagh City and District Council used the Bias Factor from the Defra LAQM Website. This was calculated by using the matrix available on the site by selecting the appropriate laboratory, year of monitoring and significant methodology. Armagh City and District Council used a bias factor for 2011 (0.84)

PM Monitoring Adjustment

All data sets for PM10 monitoring during 2011 were provided by AEAT. All monitoring data contained within this report has been adjusted and ratified by AEAT

Short-term to Long-term Data adjustment

The site at Abbey Street in Armagh required adjustment in order to annualise the result as diffusion tube monitoring only began at this location at the beginning of July 2011. During the six months of monitoring from July to the end of December 2011 there was 100% data capture at the site. The average NO2 result for that period was 33 $\mu g/m^3$.

Annualising the Abbey Street data required the use of calculations contained within Box 3.2 of TG(09). The calculation makes use of diffusion tube data from background sites within the district and in neighbouring districts. Armagh City and District opted to use data from 4 locations which are listed below in Table A.

The period mean for each of the 4 sites was taken for the same period as the monitoring at Abbey Street, July to end of December 2011.
The bias adjusted mean achieved at Abbey Street was 33 µg/m^3. This result was multiplied by the ratio attained below of **0.899** to give an annualised result of **30 µg/m^3.**

Table A: Annualising adjustment of short term mean at Abbey Street in Armagh

Site	Site Type	Annual Mean	Period Mean	Ratio
Ballyhannon Road, Portadown	Urban Background	7	7.5	0.933
Ardboe Drive Lurgan	Urban Background	9	9.6	0.938
Desart Lane Armagh	Urban Background	13	13	1
Bushvale Dungannon	Urban Background	10	13.8	0.725
			Average	**0.899**

QA/QC of automatic monitoring

The automatic monitoring site at Lonsdale Road is part of the AURN network of roadside sites. The AURN network is administered on behalf of DEFRA by Bureau Veritas. The QA/QC of data management is carried out by AEAT who visit the site to complete audits twice per year. Maintenance of the automatic monitoring equipment is carried out by Enviro Technology Ltd (ET) under contract from Southern Group Environmental Health Committee (SGEHC). ET perform site audits twice per year and are available for any urgent call outs with 24 hours notice. SGEHC facilitate the management of the monitoring site on behalf of Armagh City and District Council. Calibrations and minor maintenance is completed on a fortnightly basis by the air quality management officer at SGEHC acting as a Local Site Operator (LSO) under contract from Bureau Veritas.

QA/QC of diffusion tube monitoring

The Summary of Precision Results Nitrogen Dioxide Collocation Studies as displayed at Defra's website http://laqm.defra.gov.uk/documents/Tube_Precision_2011 (version 03/12) shows that Harwell Scientifics demonstrated good precision in 16 out of 16 collocation studies completed in 2011.

WASP Data

The 2011 WASP data for Harwell Scientifics (ESG) is contained in the table below.

Table 1: Laboratory summary performance for WASP NO2 PT rounds 108 - 115

The following table lists those UK laboratories undertaking LAQM activities that have participated in recent HSL WASP NO2 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 R108	WASP R109	WASP R110	WASP R111	WASP R112	WASP R113	WASP R114	WASP R115
Round conducted in the period	Jan – March 2010	April – June 2010	June – August 2010	Oct – Dec 2010	Jan -March 2011	April - June 2011	July - Sept 2011	October - December 2011
Aberdeen Public Analysts	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Bristol City Council	75 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Cardiff Scientific Services	100 %	50 %	100 %	75 %	100 %	100 %	100 %	75 %
Edinburgh City Council	100 %	100 %	75 %	100 %	100 %	100 %	100 %	0 %
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 %	50 %	50 %	100 %	100 %	100 %	0 %	75 %
Glasgow Scientific Services	50 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Gradko International [2]	100 %	87.5 %	100 %	100 %	100 %	100 %	100 %	37.5 %
Kent Scientific Services	100 %	100 %	100 %	100 %	50 %	100 %	100 %	75 %
Kirklees MBC	100 %	100 %	100 %	0 %	100 %	0 %	0 %	50 %
Lambeth Scientific Services	50 %	100 %	100 %	100 %	50 %	25 %	100 %	25 %
Lancashire County Analysts [3]	100 %	75 %	50 %	100 %	75 %	-	-	-
Milton Keynes Council	100 %	25 %	50 %	100 %	100 %	75 %	100 %	100 %
Northampton Borough Council	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Somerset Council [4]	-	-	-	-	-	-	-	100 %
South Yorkshire Council Laboratory [5]	25 %	-	-	-	-	-	-	-
South Yorkshire Air Quality Samplers [6]	-	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Staffordshire County Council	100 %	100 %	50 %	100 %	100 %	100 %	100 %	100 %
Tayside (formerly Dundee CC)	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Walsall MBC [7]	-	100 %	100 %	100 %	-	-	-	-
West Yorkshire Analytical Services	100 %	100 %	100 %	100 %	75 %	75 %	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] No longer involved in NO2 diffusion tube measurements from R113.
[4] New participant from R115.
[5] No longer involved in NO2 diffusion tube measurements from R109.
[6] New participant from R109.
[7] Results for WASP R107, R108 and R112 not submitted. No longer involved in NO2 diffusion tube measurements from R113.

Appendix B: Diffusion Tube Monitoring Maps 2011

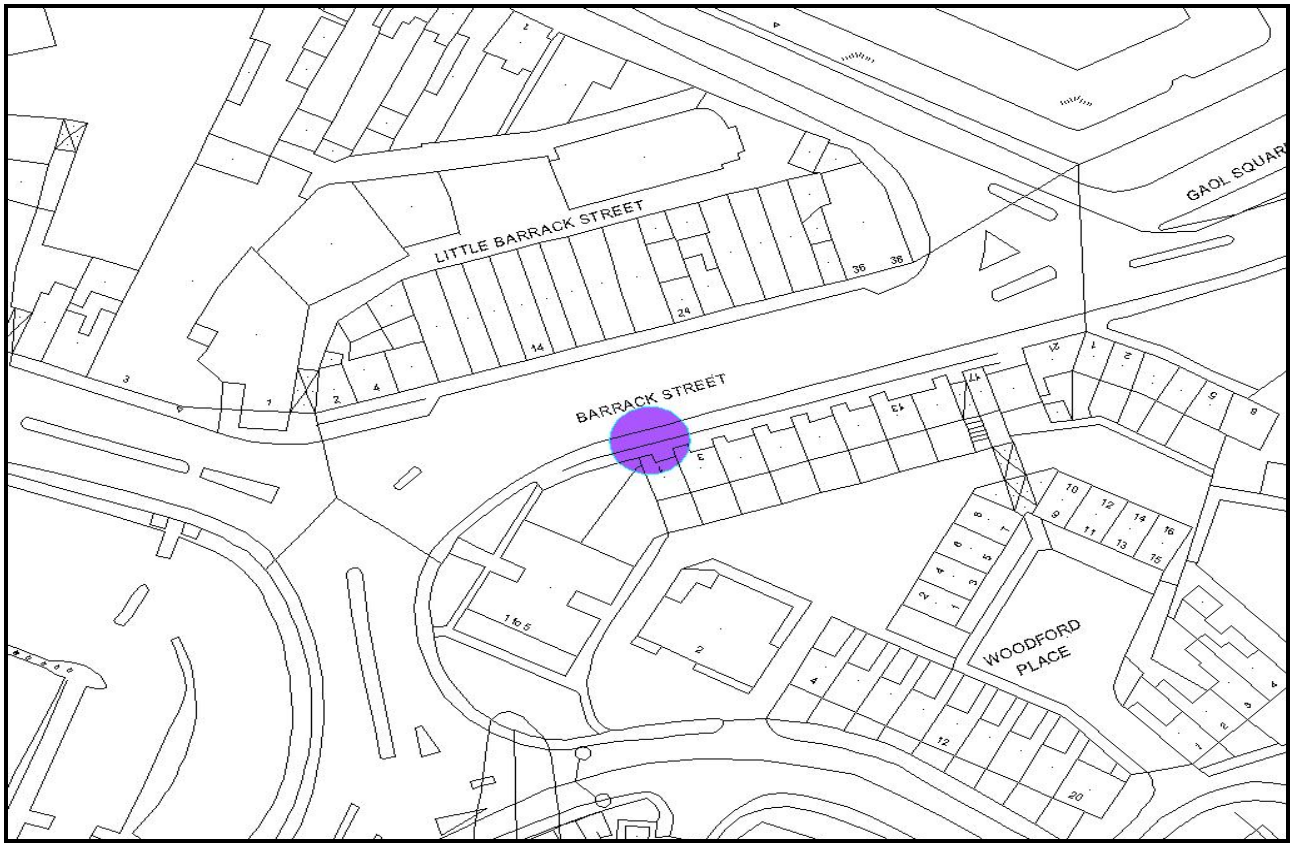
Appendix C – Diffusion Tube Site Maps

Title : Diffusion Tube Locations

Scale : Not to Scale

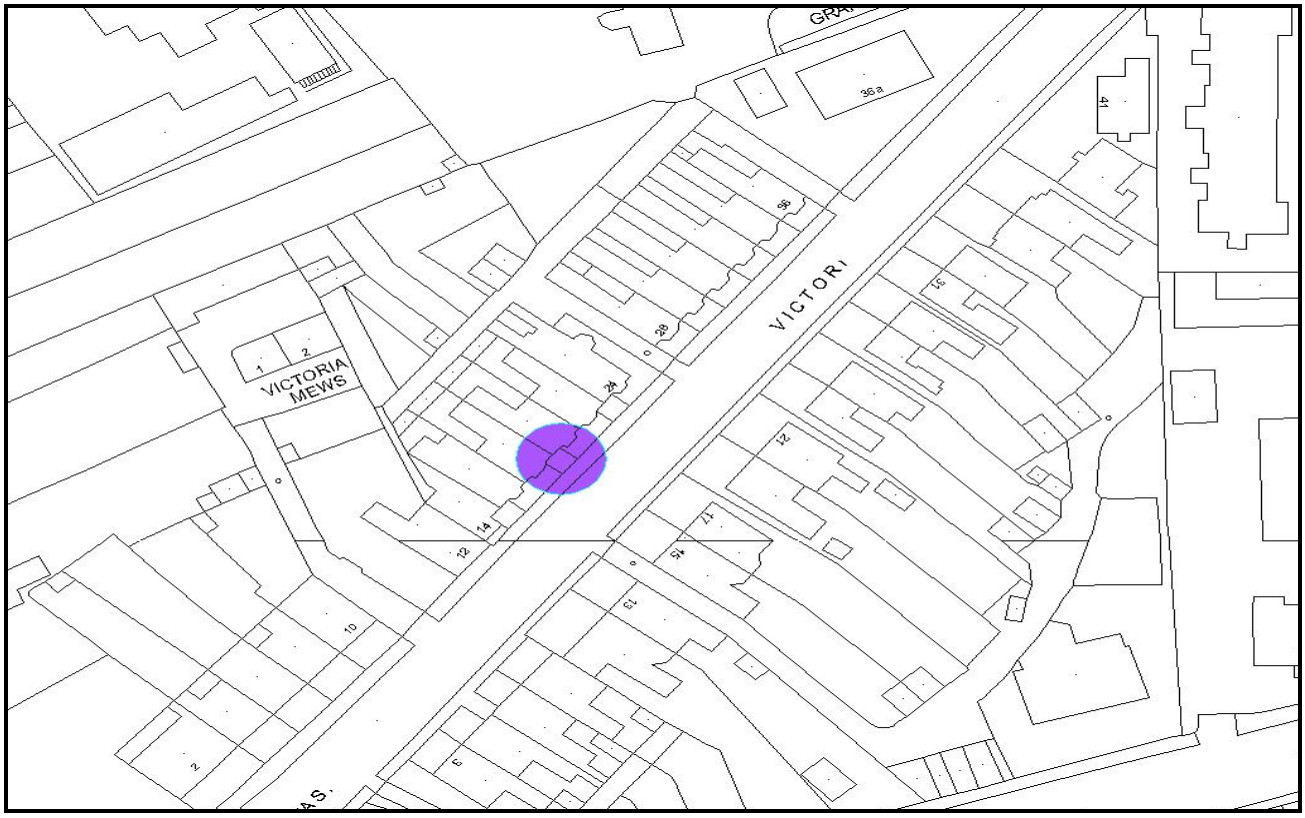
29/04/2009

1 Barrack Street

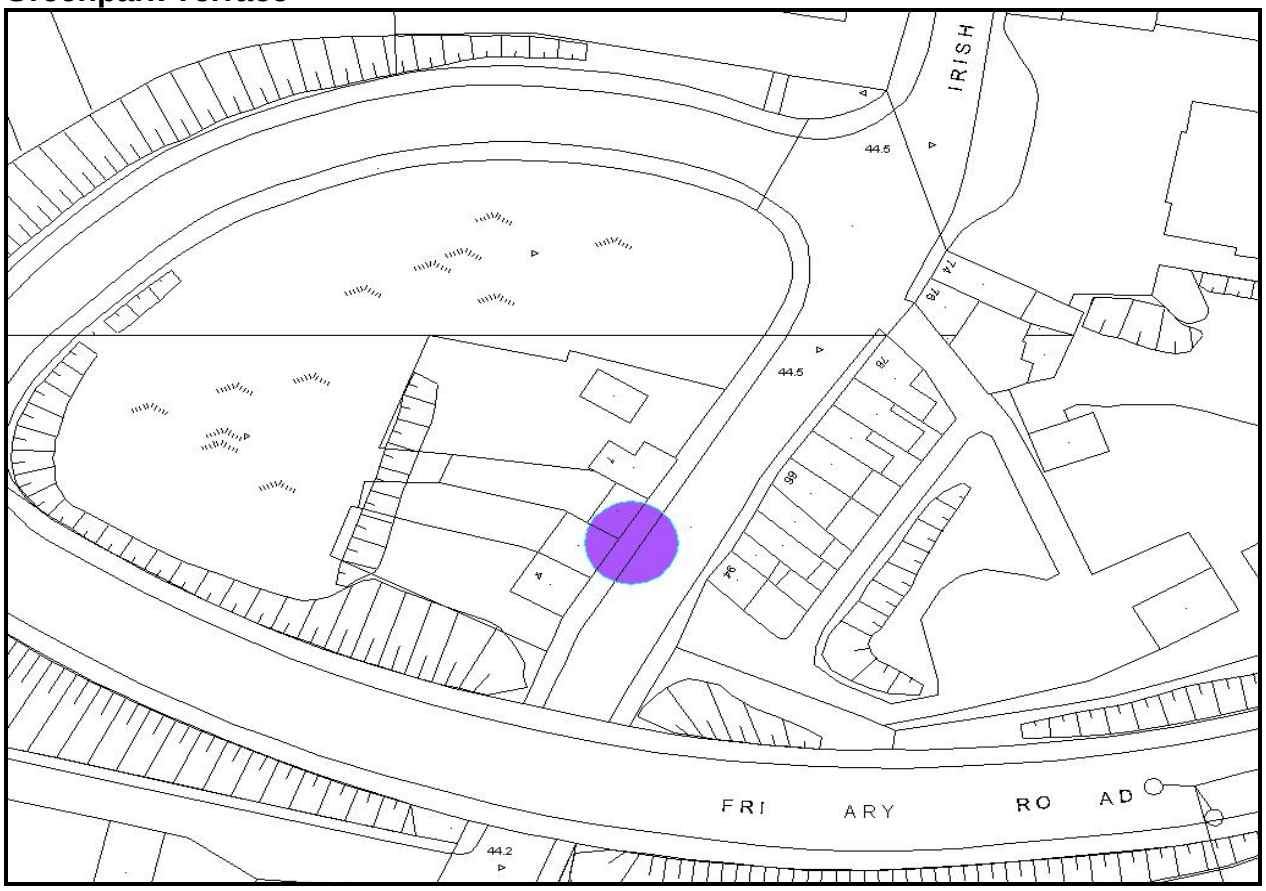


3 Barrack Hill

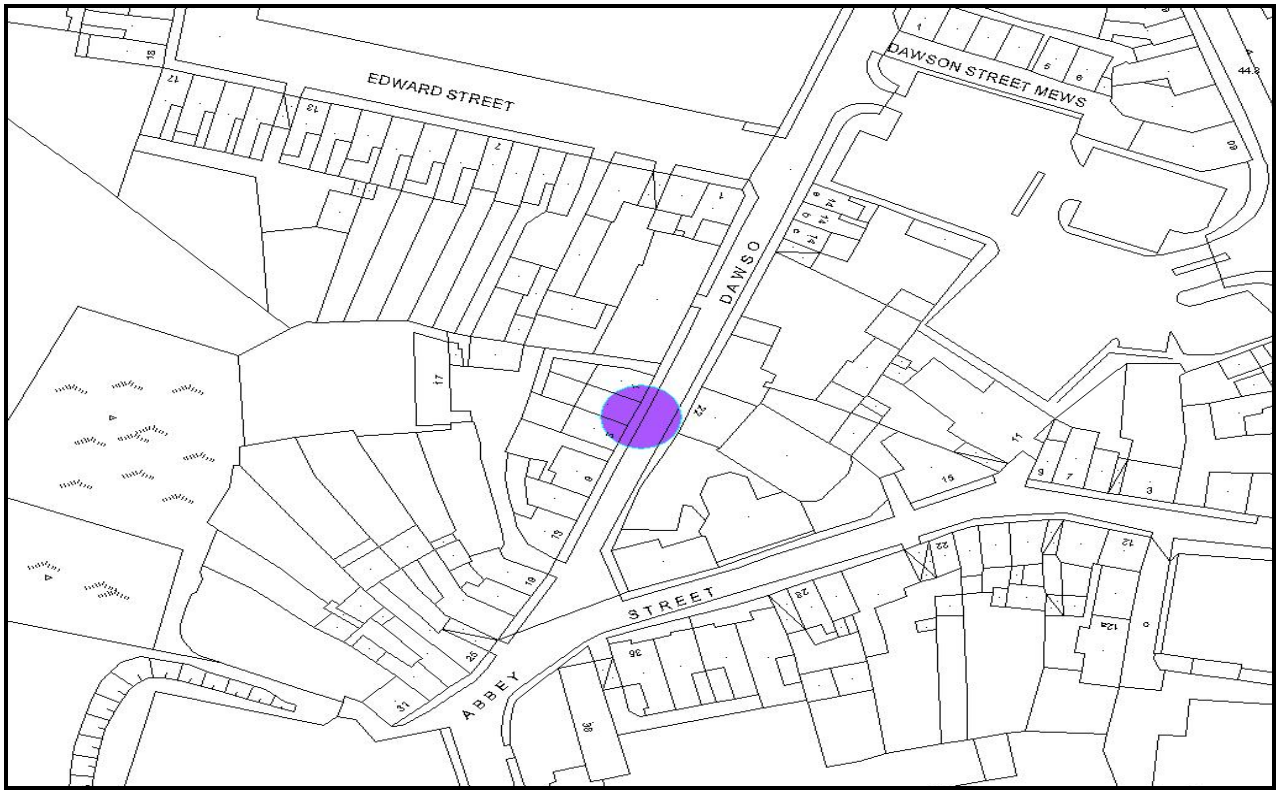
Victoria Street



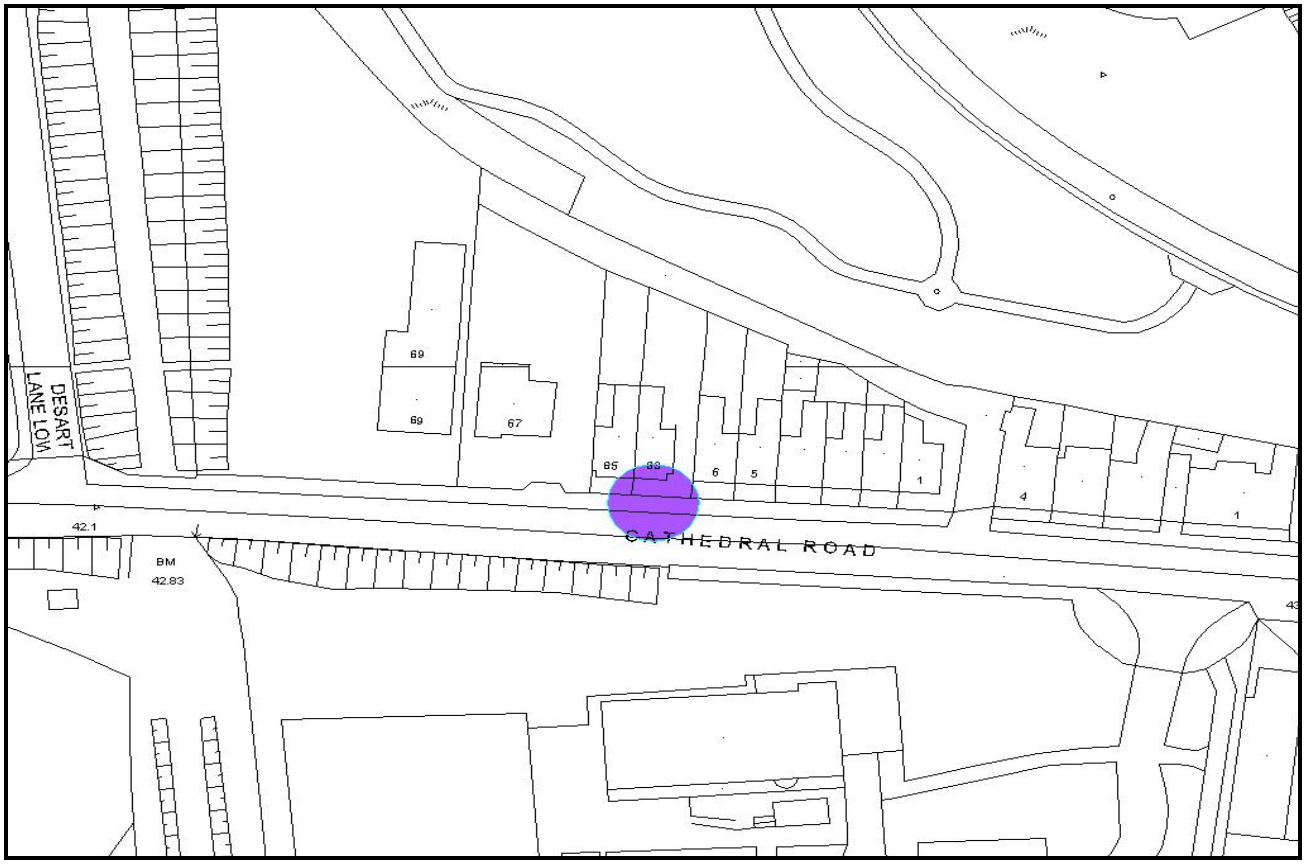
Greenpark Terrace



Dawson Street



Cathedral Road



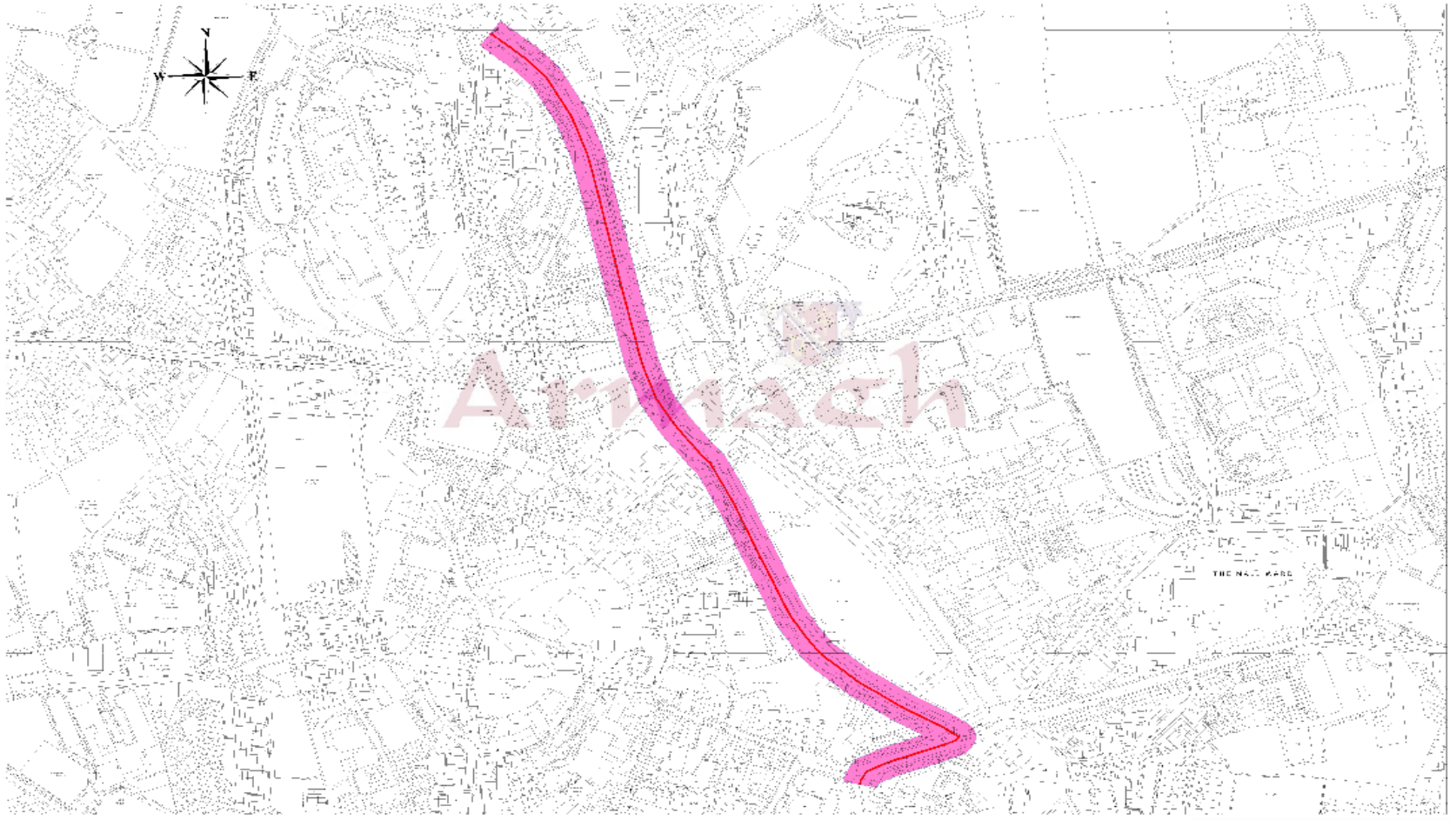
Appendix C – Diffusion Tube Results 2011

NO2 DIFFUSION TUBE RESULTS 2011 (µg/m^3)

	1 Barrack St	11 Desart Lane	19 Folly Lane	Railway St	Mall West	1 Greenpark Terrace	Lonsdale Road	Abbey St	20 Victoria St	Barrack Hill	Cathedral Terrace	Dawson St
JANUARY	56	29	27	75	67	85	60	-	55	41	40	46
FEBRUARY	59	25	21	68	65	74	49	-	40	50	31	41
MARCH	50	19	21	66	64	67	46	-	43	50	34	37
APRIL	50	11	14	56	50	65	34	-	31	40	25	24
MAY	34	9	9	59	40	42	26	-	22	33	18	19
JUNE	40	11	15	57	48	59	35	-	32	33	25	23
JULY	33	7	10	41	36	44	25	38	27	25	23	17
AUGUST	32	10	12	51	45	51	30	40	27	30	22	21
SEPTEMBER	36	10	11	55	45	49	29	34	27	34	16	22
OCTOBER	40	13	15	64	47	58	18	42	32	35	20	24
NOVEMBER	53	24	16	62	50	54	40	45	29	40	29	35
DECEMBER	31	14	14	55	52	57	38	38	34	42	18	25
AVERAGE	43	15	15	59	51	59	36	40	33	38	25	28
Adjusted Ave	36	13	13	50	43	49	30	30*	28	32	21	23

- Annual Mean adjusted using Box 3.2 in TG(09) Ratio = 0.899

Appendix D – Armagh AQMA Area



Title : Armagh City and District Council AQMA 2008

Scale : Not to Scale

10/11/2008