BALLYMONEY
BOROUGH COUNCIL

2013 Air Quality Progress Report for Ballymoney Borough Council

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

August, 2013

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Executive Summary

The Environment (Northern Ireland) Order 2002 and subsequent Regulations introduced the Local Air Quality Management (LAQM) system which requires District Councils to undertake regular review and assessment of air quality, with respect to the standards and objectives set in the Air Quality Strategy. In areas where an air quality objective is predicted not to be met by the required date, District Councils are required to establish Air Quality Management Areas (AQMA's) and implement Action Plans to improve air quality. This document forms the Progress Report for Ballymoney Borough Council. In writing this report the Council has had regard to the Government's published guidance confirmed in Progress Report Guidance LAQM.PRGNI (04).

This report provides the latest NO_2 monitoring results from the diffusion tubes located in the Ballymoney Town area. This Nitrogen Dioxide diffusion tube monitoring carried out across the Borough indicates that the Air Quality Objectives for this pollutant continue to be met and that exceedances are not anticipated, however, Ballymoney Borough Council will continue to monitor through the use of diffusion tubes. The report notes that there have been no significant changes in relation to air quality within the Borough and that no need has been identified to progress to a detailed assessment for any pollutant.

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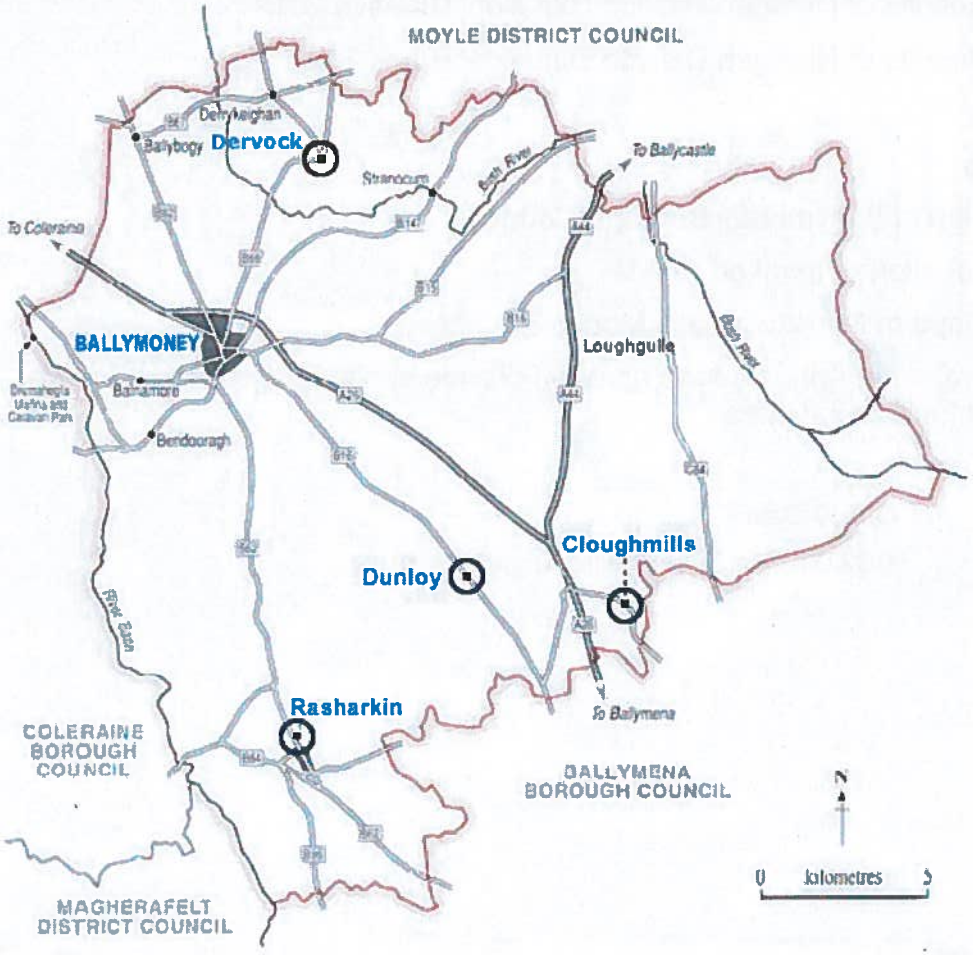
1 Introduction

1.1 Description of Local Authority Area



Ballymoney Borough covers 161 sq miles (41,700 hectares) and is predominantly rural in character. The town of Ballymoney is its administrative, commercial and educational centre, and there are a number of small villages in the rural hinterland. The Borough lies within the Antrim Coast and Glens Area of Outstanding Natural Beauty and also the Lower Bann valley, which forms part of the Borough's western boundary. The area's population has grown from 26,894 in 2001 to o 31,224 in 2011 with one-third of the population of the borough living near or within the town of Ballymoney. The current population represents 1.7% of the population of Northern Ireland and since 2001 the borough has enjoyed a constant population growth rate of 1.7% per annum, (this rose to 1.8% 2006-2007), as a result of both positive natural change and a net inward migration to the borough.

The age composition of the population closely reflects the average for Northern Ireland as a

whole, with the proportion of young people under 16 decreasing (slightly) to 21.2%, a working age population of 63.9% and with pensioners living in the borough accounting for 14.9%. Although the population of the borough is continually increasing the population density remains relatively low with 75 people per sq km.

The number of homes in the borough is currently 11,508 although Ballymoney has a total catchment of almost 75,000 homes within 30 minutes travelling distance from the town.

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 microgrammes 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

Ballymoney Borough Council Progress Report dated June 2010 concluded that PM_{10} monitoring carried out from December 2003 to December 2009 within the Glebeside Estate in Ballymoney town, showed that all national objective limits for this pollutant were now being met and sustained and the Air Quality Management Area declared in relation to this could now be revoked. This has been carried out and there is no longer an AQMA within Ballymoney Borough Council and monitoring for PM_{10} has ceased.

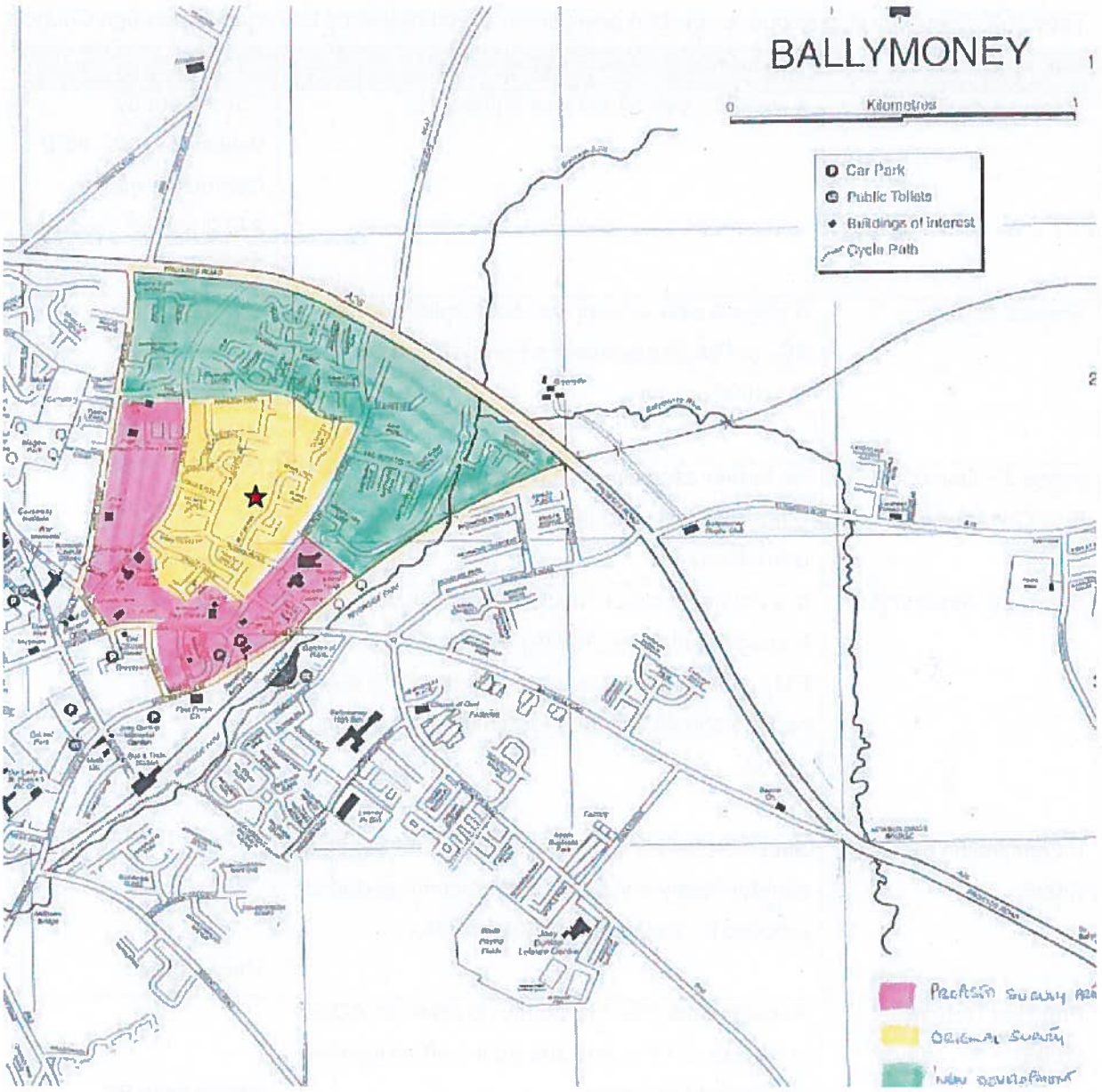


Figure 2: Location of revoked Air Quality Management Area within Ballymoney Borough Council (★ indicates location of PM10 monitor)

This progress report and the subsequent Updating and Screening Assessment 2012 showed that the Air Quality Objectives for Nitrogen Dioxide were being met and that exceedences were not anticipated, however, Ballymoney Borough Council would continue to monitor through the use of diffusion tubes.

These reports also concluded that there were no new local developments identified that would require more detailed consideration and that new monitoring data had not identified any likely breaches of the air quality objectives and that it was not necessary to proceed to a detailed assessment for any of the monitored pollutants

Table 1.2: Summary of previous review and assessments undertaken by Ballymoney Borough Council

Stage	Recommendations or other actions	Report
Stage 1 (2000)	A stage 2 assessment was carried out.	Carried out by Ballymoney BC. HES Committee minute 246.2.5.6 29th August 2000.
Stage 2 (2002)	A stage 3 assessment was not required for NO_2, SO_2 or PM_{10} for emissions from vehicular or industrial sources.	Hobson (2002)
Stage 3 – Domestic Fuel Combustion (2004)	No further assessment is needed in the Glebeside area. Monitoring data was from Carrickfergus.	Grice (2004)
Stage 2/3 Assessment	It is not necessary to declare an Air Quality Management Area (AQMA) with respect to either PM_{10} particulates or sulphur dioxide, PM_{10} data capture should continue for a further 12-month period.	Ballymoney BC (2004)
Reverification report (2005)	Based on the measured exceedance of the daily standard Ballymoney BC were recommended to proceed to declare an AQMA for PM_{10}.	Haig (2005)
Progress Report (2005)	Recommends that the Council declare an AQMA in respect of PM_{10} and submit a draft action plan to relevant authorities.	Ballymoney BC (2005)

Stage 4 (2006) – Domestic Fuel Combustion.	PM_{10} concentrations in 2004 were corrected (by dividing through by a factor of 1.2). Exceedance of PM_{10} concentrations. AQMA declaration was recommended to continue.	Targa (2006)
Updating and Screening Assessment (2006)	Indicates that the objective will not be met for the daily mean PM_{10} objective within the AQMA but will be achieved elsewhere within the Borough.	Ballymoney BC (2006)
Progress Report (2007)	To progress the air quality action plan and continue further monitoring of particulate matter.	Ballymoney BC (2007)
Progress Report (2008)	To monitor local levels of PM_{10} to determine the improvements made by the NIHE solid fuel to gas conversion scheme.	Ballymoney BC (2008)
Impact of heating conversion scheme on AQMA report (2009)	PM_{10} objectives have been met and are not likely to be breached in the future. Recommends revocation of AQMA	AEA (2009)
Updating and Screening Assessment (2009)	PM_{10} objectives have been met and are not likely to be breached in the future. Recommends revocation of AQMA and to continue monitoring Nitrogen Dioxide by diffusion tubes although national objectives are being met.	Ballymoney BC(2009)
Progress Report (2010)	Monitoring for PM_{10} ceased and the AQMA was revoked. Monitoring for NO_2 continued.	Ballymoney BC(2010)
Progress Report (2011)	The report notes that there have been no significant changes in relation to air quality within the Borough and that no need has been identified to progress to a detailed assessment for any pollutant.	Ballymoney BC(2011)
Updating and Screening Assessment (2012)	The report notes that there have been no significant changes in relation to air quality within the Borough and that no need has been identified to progress to a detailed assessment for any pollutant.	Ballymoney BC(2012)

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

In January 2010 Ballymoney Borough Council decommissioned the Met One BAM 1020 analyser located within the Glebeside residential development. There is no longer any automatic monitoring conducted for any pollutants within the Ballymoney Borough Council area.

2.1.2 Non-Automatic Monitoring Sites

Nitrogen oxide (NO) and Nitrogen dioxide (NO_2) are both oxides of nitrogen collectively referred to as NOx. NO is oxidised to form NO_2. Combustion processes, including those in vehicle engines, give rise to this mixture of NOx gases. High concentrations of NO_2 can irritate the respiratory system and affect human health.

Ballymoney Borough Council is currently monitoring nitrogen dioxide at 8 sites throughout Ballymoney Town using passive diffusion tubes. Diffusion tubes provide a low cost means of indicatively monitoring the level of NO_2 in the air. The passive diffusion tube is a clear plastic tube open at one end with the closed end containing an absorbent for the gas and absorbs the pollutant direct from the surrounding air.

The tubes are exposed for either 4 or 5 weeks at a time. Results from analysis of the tubes can then be used to compare the level of NO_2 against the annual mean objective for NO_2.

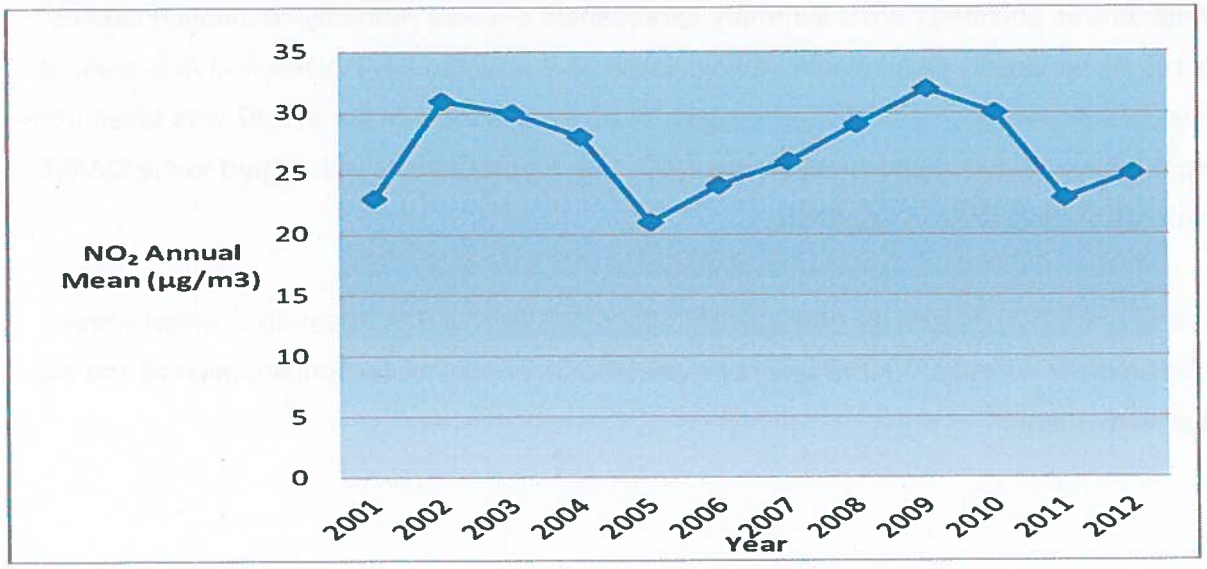
Diffusion tubes are analysed by Gradko who currently meet all relevant standards and received a good rating in the DEFRA summary of precision results accessed at http://laqm.defra.gov.uk/documents/Tube_Precision_2013_version_07_13-Final.pdf

Diffusion tubes frequently exhibit bias (over- or under-read) relative to the chemiluminescence analyser (the reference technique for NO_2), and the Guidance states that it is necessary to correct for any such bias, when using diffusion tube results for review and assessment purposes. As Ballymoney Borough Council does not have any permanent automatic NO_2 monitoring sites, they are not able to carry out the necessary intercomparison locally. Instead, information was obtained from a summary spreadsheet of Local Authority co-location studies prepared by Air Quality Consultants and available via the Air Quality Review and Assessment website, at http://www.uwe.ac.uk/aqm/review. A bias adjustment factor of 0.97 was taken from the spreadsheet of bias adjustment factors (v07_13). Further details with regard to the QA/QC procedures are available in Appendix 1.

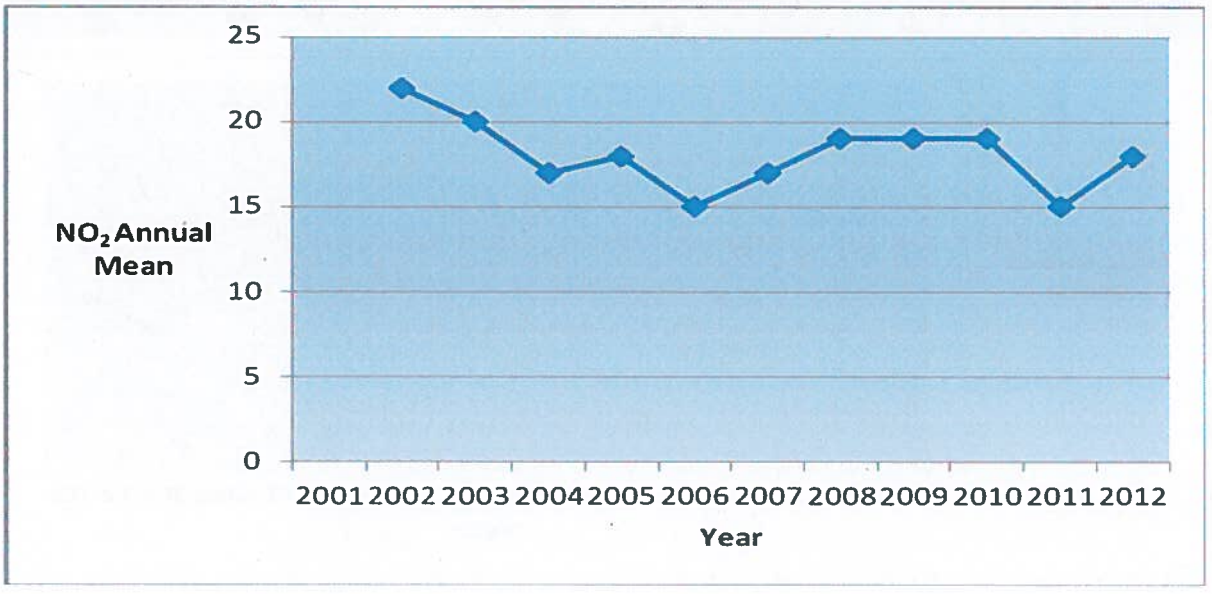
A table of the 2012 nitrogen dioxide concentrations can be found in Appendix 2 which shows that Ballymoney Borough Council has not measured an annual mean concentration at any site greater than 40µg/m^3

Figure 3 Maps of Non-Automatic Monitoring Sites

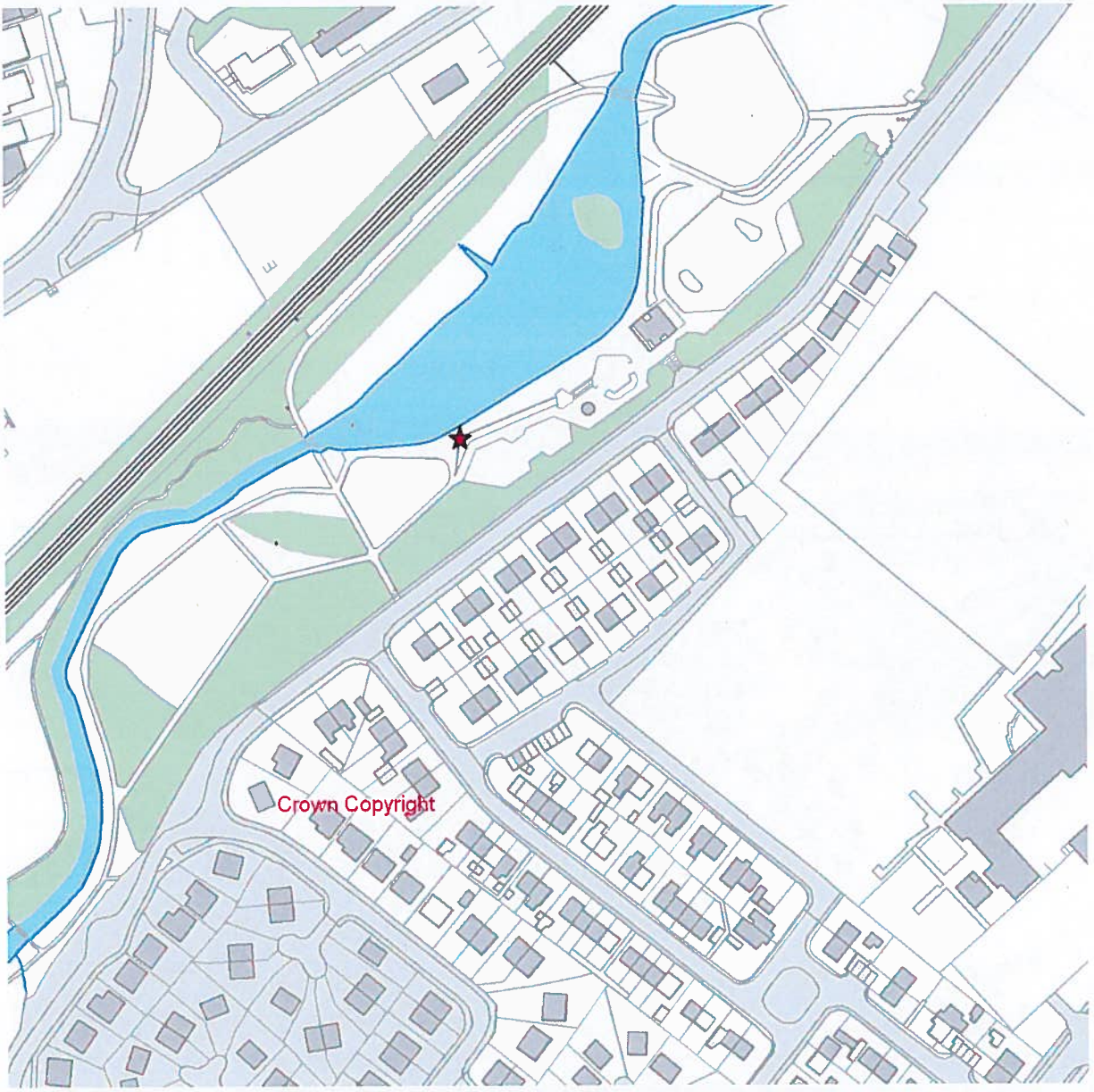
1N Kerbside 19 Linenhall Street

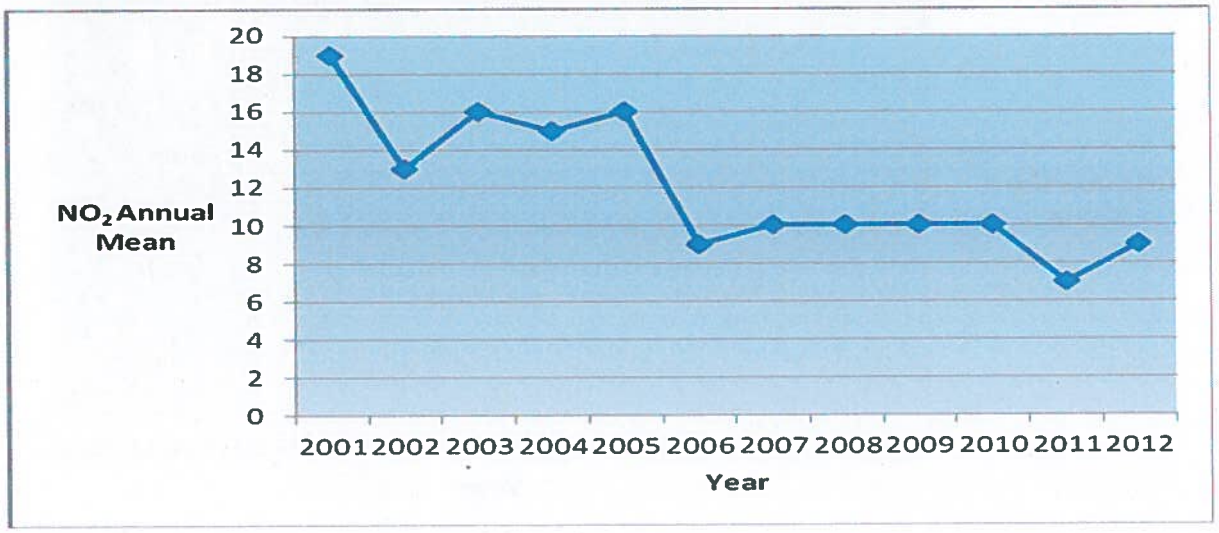


2N Kerbside 8 Ballybogey Road

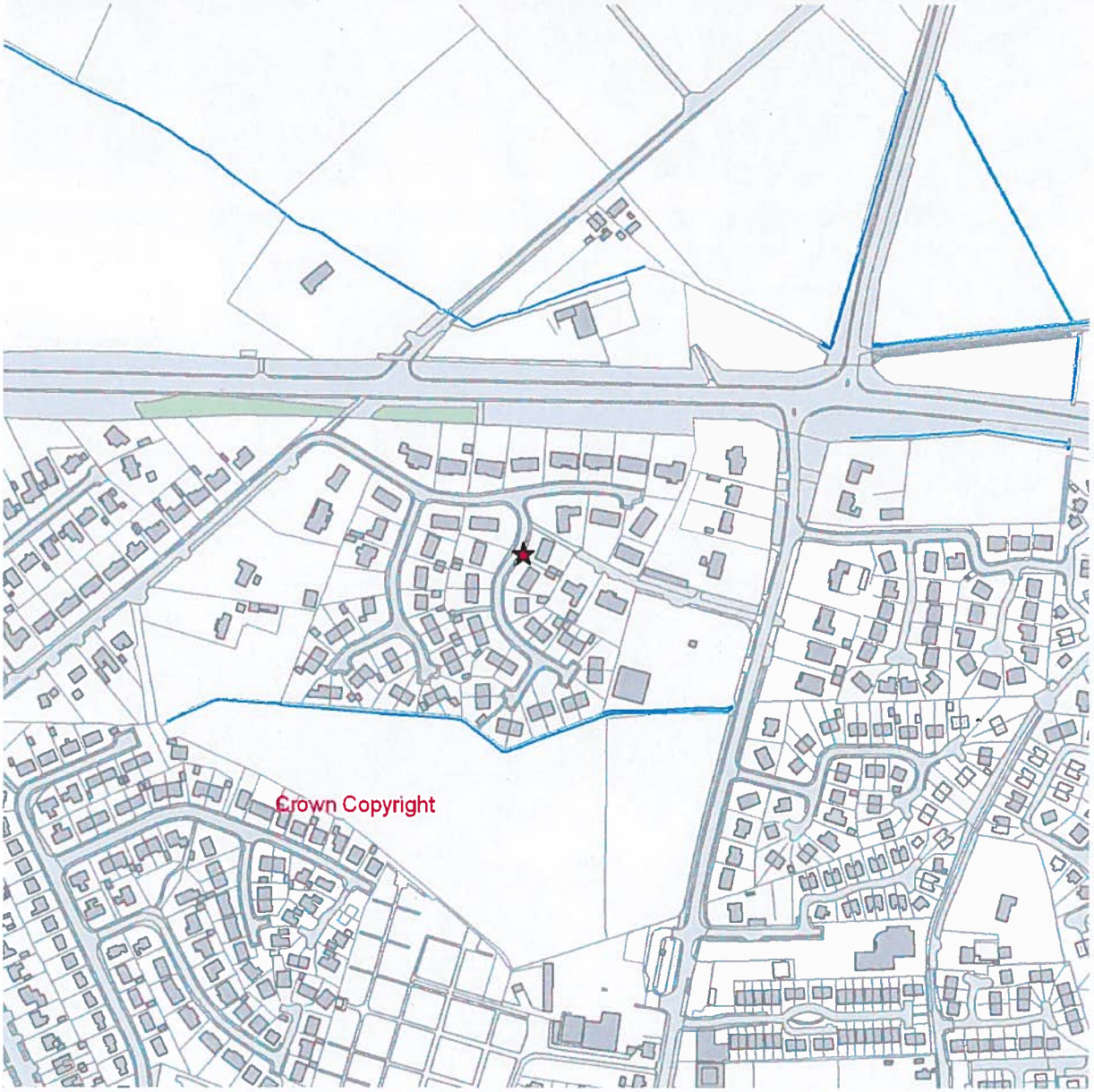


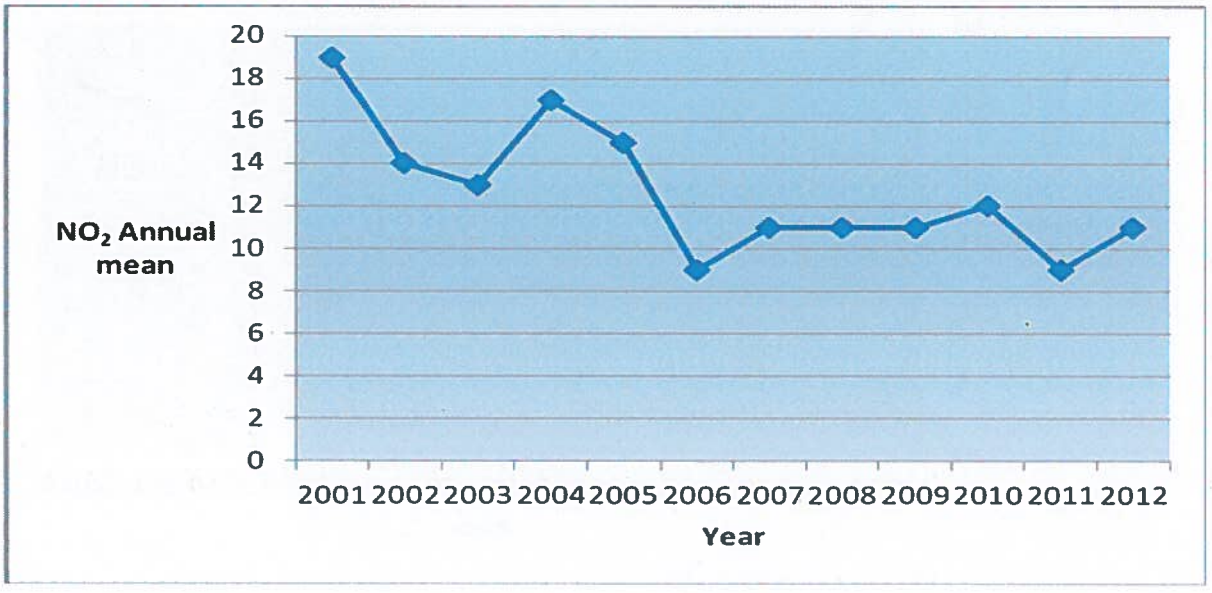
3N Urban Background Opposite 16 Armour Avenue



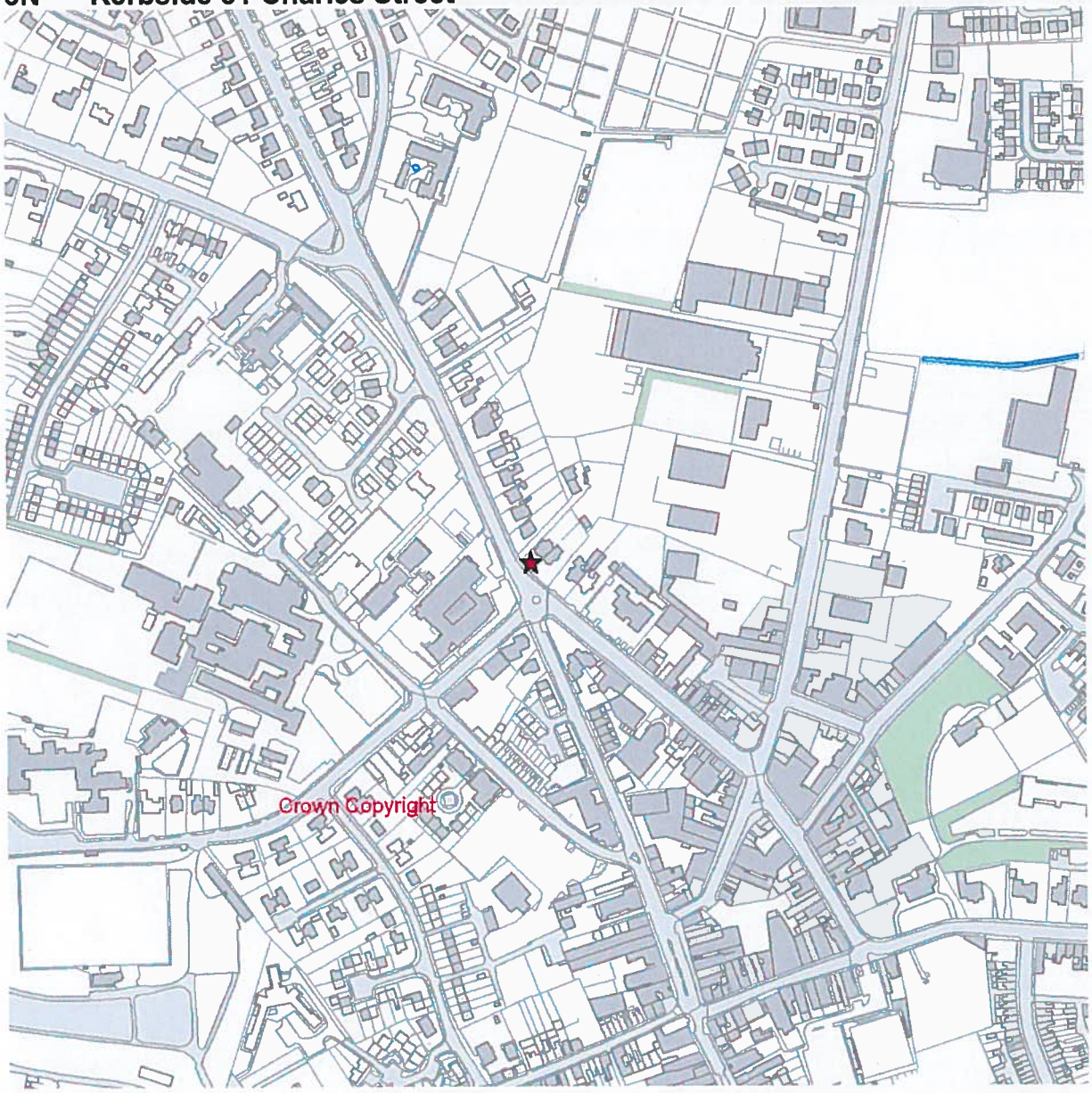


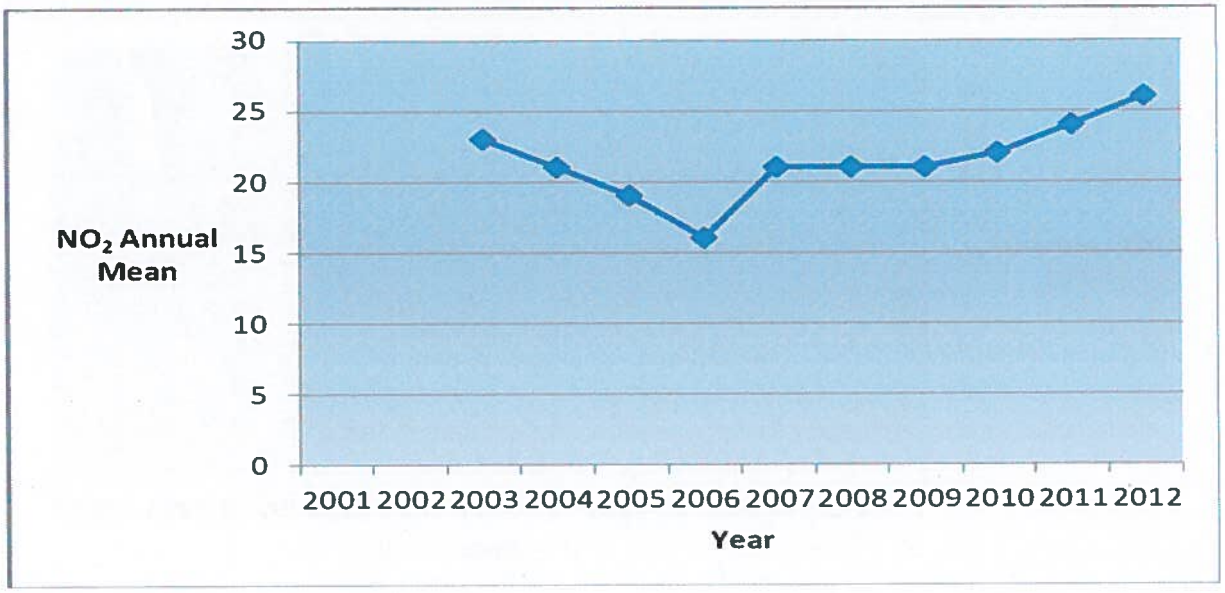
4N Urban Background 2-4 Semicock Avenue



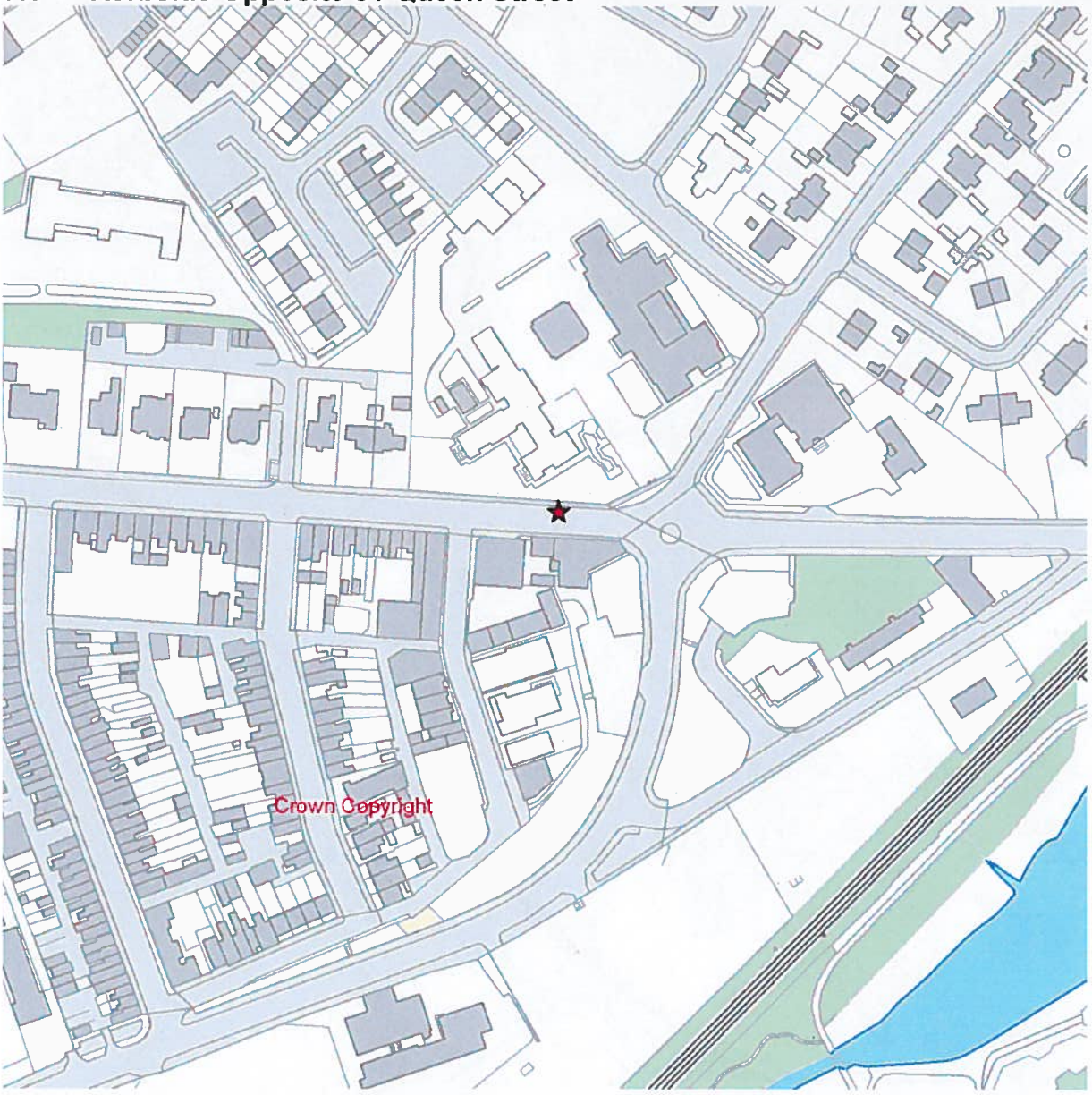


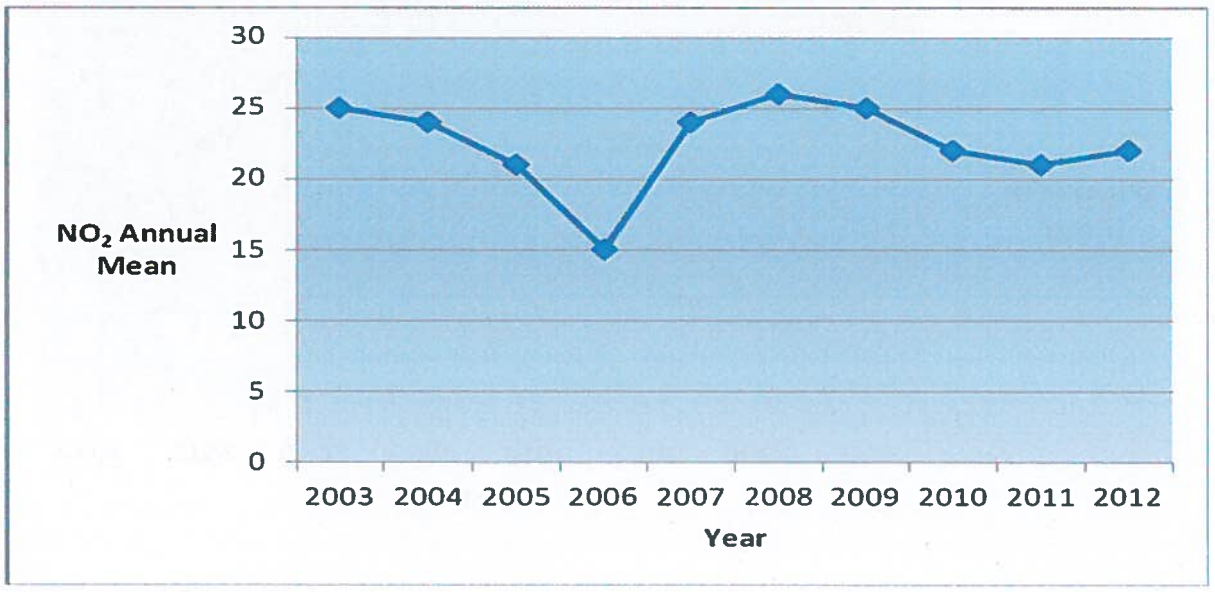
6N Kerbside 31 Charles Street



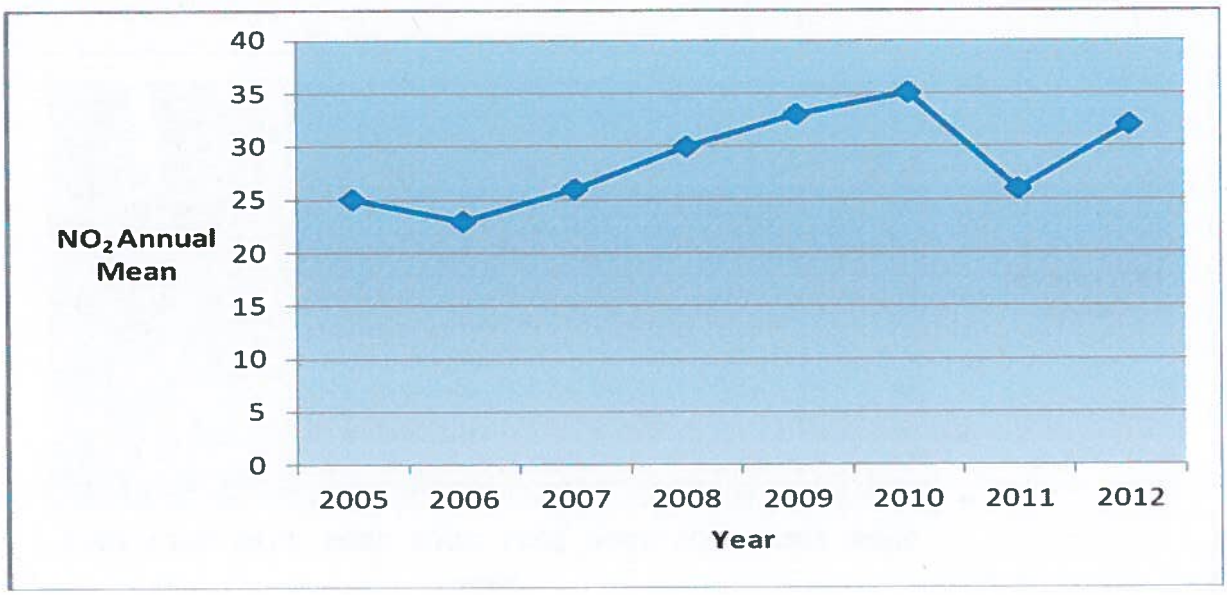


7N Kerbside Opposite 51 Queen Street





8N Kerbside Meetinghouse Street



9N Kerbside Castle Street

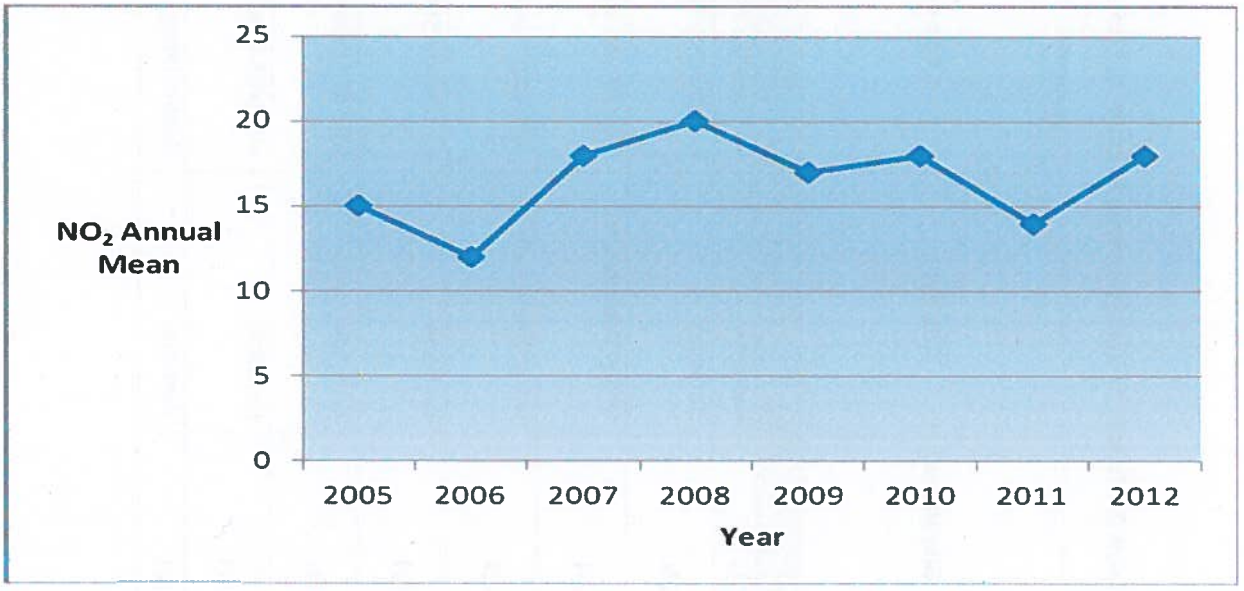


Table 2.1 Details of Non-Automatic Monitoring Sites

Site Name	Site Type	Address	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?
1N	Kerbside	19 Linenhall St	NO_2	N	N	1m	Y
2N	Kerbside	8 Ballybogey Road	NO_2	N	Y (10m)	1m	Y
3N	Urban Background	Opp 16 Armour Ave	NO_2	N	Y (20m)	N/A	Y
4N	Urban Background	Semicock Avenue	NO_2	N	Y (5m)	N/A	Y
6N	Kerbside	31 Charles Street	NO_2	N	Y (10m)	1m	Y
7N	Kerbside	Opp 51 Queen Street	NO_2	Y	Y (15m)	1m	Y
8N	Kerbside	Meetinghouse Street	NO_2	N	Y (15m)	1m	Y
9N	Kerbside	Castle Street	NO_2	N	Y (10m)	1m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

Ballymoney Borough Council ceased automatic monitoring of PM_{10} in December 2010 and revoked the Ballymoney Town Air Quality Management Area. Monitoring is currently undertaken for Nitrogen Dioxide by use of diffusion tubes, results of which are detailed below.

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

Ballymoney Borough Council does not operate automatic monitoring equipment for Nitrogen Dioxide

Diffusion Tube Monitoring Data

The NO_2 monthly diffusion tube data for 2012 is shown in Appendix 2. Annual mean concentrations are shown in Table 2.2 below. The annual mean air quality objective of 40 $\mu g/m^3$ was not exceeded at any of the monitoring sites.

Table 2.2 Results of Nitrogen Dioxide Diffusion Tubes in 2011

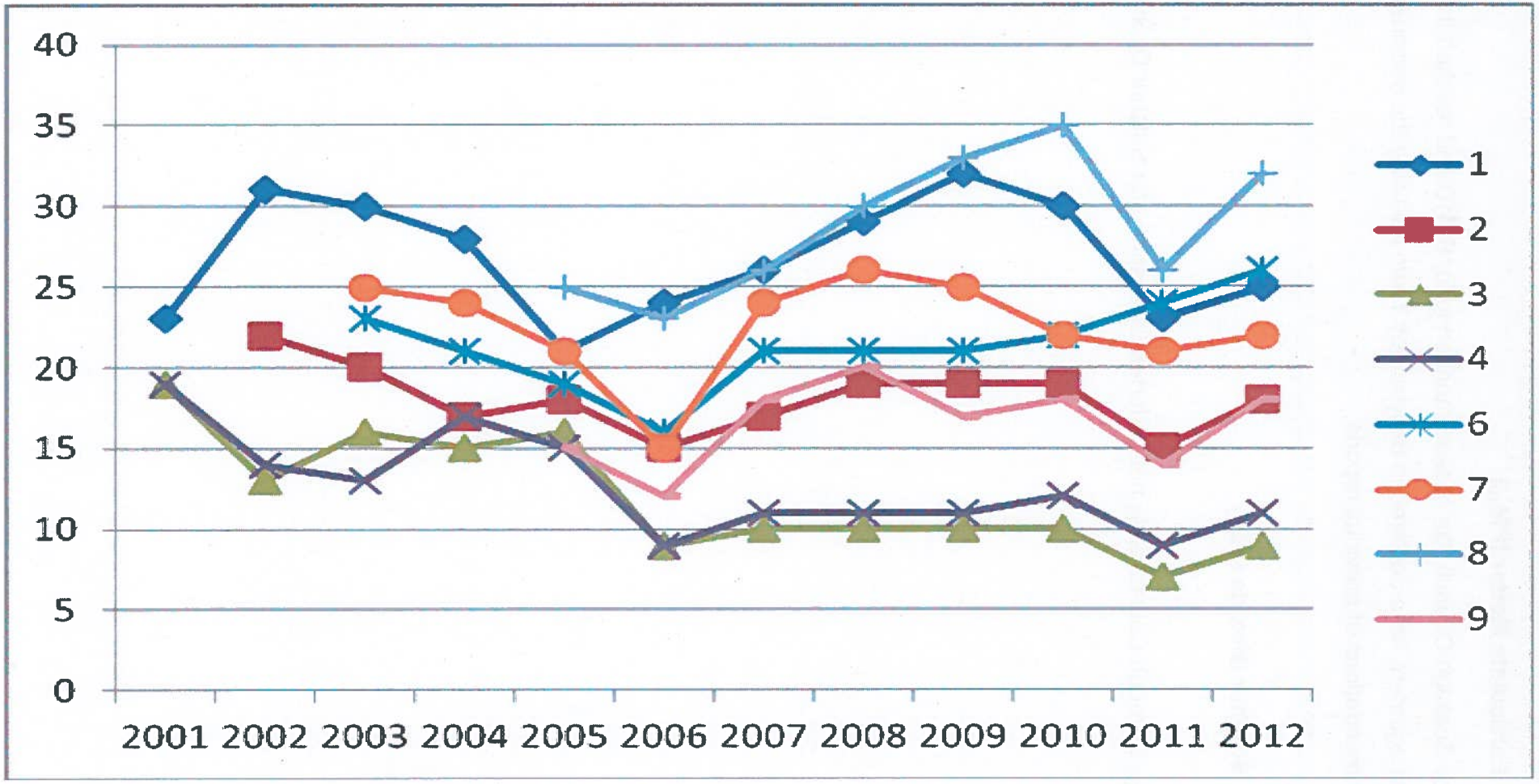
Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2011 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.97) 2012 (µg/m^3)
1N	19 Linenhall Street	Kerbside	N	n/a	12 months	n/a	N	25.09
2N	8 Ballybogey Road	Kerbside	N	n/a	12 months	n/a	N	18.43
3N	Opposite 16 Armour Ave	Urban Background	N	n/a	10 months	n/a	N	9.54
4N	2-4 Semicock Avenue	Urban Background	N	n/a	11 months	n/a	N	10.59
6N	31 Charles Street	Kerbside	N	n/a	12 months	n/a	N	25.34
7N	Opposite 51 Queen St	Kerbside	N	n/a	11 months	n/a	N	23.47
8N	Meetinghouse Street	Kerbside	N	n/a	11 months	n/a	N	31.40
9N	Castle Street	Kerbside	N	n/a	12 months	n/a	N	17.80

[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 2.3 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 = 1.06)	2008* (Bias Adjustment Factor = 0.9)	2009* (Bias Adjustment Factor = 0.99)	2010* (Bias Adjustment Factor = 0.92)	2011 (Bias Adjustment Factor = 0.89)	2012 (Bias Adjustment Factor = 0.97)
1N	19 Linenhall Street	N	26	29	32	30	23	25
2N	8 Ballybogey Road	N	17	19	19	19	15	18
3N	Opposite 16 Armour Ave	N	10	10	10	10	7	10
4N	2-4 Semicock Avenue	N	11	11	11	12	9	11
6N	31 Charles Street	N	21	21	21	22	24	25
7N	Opposite 51 Queen St	N	24	26	25	22	21	23
8N	Meetinghouse Street	N	26	30	33	35	26	31
9N	Castle Street	N	18	20	17	18	14	18

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



2.2.2 Particulate Matter (PM_{10})

Ballymoney Borough Council has ceased monitoring for PM10 and revoked the Air Quality Management Area declared in Ballymoney Town following the conclusions and recommendations of previous reports.

2.2.3 Sulphur Dioxide (SO_2)

Ballymoney Borough Council does not undertake monitoring for Sulphur Dioxide.

2.2.4 Benzene

Ballymoney Borough Council does not undertake monitoring for Benzene.

2.2.5 Other Pollutants Monitored

Ballymoney Borough Council does not undertake monitoring for any other pollutants.

2.2.6 Summary of Compliance with AQS Objectives

Ballymoney 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 Developments

3.1 Road Traffic Sources

Ballymoney Borough Council has not identified any of the following that are new since the last Updating and Screening Assessment.

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

3.2 Other Transport Sources

Ballymoney Borough Council has not identified any of the following that are new since the last Updating and Screening Assessment.

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

3.3 Industrial Sources

Ballymoney Borough Council has not identified any of the following that are new since the last Updating and Screening Assessment.

- **Industrial installations:** new or proposed installations for which an air quality assessment has been carried out.
- **Industrial installations:** existing installations where emissions have increased substantially or new relevant exposure has been introduced.
- **Industrial installations:** new or significantly changed installations with no previous air quality assessment.
- Major fuel storage depots storing petrol.
- Petrol stations.
- Poultry farms.

3.4 Commercial and Domestic Sources

Ballymoney Borough Council has not identified any of the following that are new since the last Updating and Screening Assessment.

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

3.5 New Developments with Fugitive or Uncontrolled Sources

Ballymoney Borough Council has not identified any of the following that are new since the last Updating and Screening Assessment.

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

Ballymoney 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.

Ballymoney 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 Planning Applications

A planning application reference D/2013/0172/F has been submitted for a proposed anaerobic digester. Ballymoney Borough Council as a statutory consultee in the planning process has requested that an air quality impact assessment be completed.

Planning applications reference D/2013/0014/O and D/2013/0075/O have been received for new petrol stations at 233 Frosses Road, Cloughmills and 2 Bellaghy Road, Dunloy respectively. These applications, if approved, will be subject to control under the Pollution Prevention and Control (Northern Ireland) Regulations 2003.

5 Conclusions and Proposed Actions

5.1 Conclusions from New Monitoring Data

Ballymoney Borough Council monitored for nitrogen dioxide at eight sites throughout 2012. No exceedances of the annual mean air quality objective were identified at any of the sites and no significant trends have been noted in the data.

5.2 Conclusions relating to New Local Developments

Ballymoney 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.

Ballymoney 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**

5.3 Other Conclusions

A number of planning applications are currently being considered that have the potential to adversely impact on air quality should suitable controls not be implemented.

5.4 Proposed Actions

New monitoring data has not identified any likely breaches of the air quality objectives and it is not necessary to proceed to a detailed assessment for any pollutants. Monitoring of nitrogen dioxide with diffusion tubes will continue at the current eight sites.

Ballymoney Borough Councils next air quality report will be the 2014 progress report.

6 References

Part IV of the Environment Act 1995

Environment (Northern Ireland) Order 2002 Part III

Local Air Quality Management Guidance Technical Guidance, (LAQM.TG(09)) defra 2009.

DOE Northern Ireland Air website http://www.airqualityni.co.uk/

Defra Local Air Quality Management (LAQM) Support website http://laqm.defra.gov.uk/

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2000)

Air Quality Regulations (Northern Ireland) 2003

Ballymoney Borough Council Review and Assessment of Air Quality Stage 1 Report 2001

Ballymoney Borough Council Review and Assessment of Air Quality Stage 2 & 3 Report 2004

Ballymoney Borough Council Progress Report 2005

Ballymoney Borough Council Update and Screening Assessment 2006

Ballymoney Borough Council Progress Report 2007

Ballymoney Borough Council Progress Report 2008

Ballymoney Borough Council Update and Screening Assessment 2009

Ballymoney Borough Council Progress Report 2010

Ballymoney Borough Council Progress Report 2011

Ballymoney Borough Council Updating and Screening Assessment 2012

Appendices

Appendix 1 QA/QC Data

Nitrogen Dioxide diffusion tubes were supplied and analysed by Gradko Environmental Ltd., St Martins, 77 Wales Street, Winchester, Hampshire, SO23 ORH from mid 2008 onwards. The preparation method is 20% TEA in water. Gradko Environmental Ltd is a UKAS accredited laboratory and follows Laboratory Quality Procedures. Analysis is carried out in accordance with documented in-house laboratory method GLM7.

Gradko Environmental Ltd has a bias adjustment factor of 0.97 for 2012. The corrected NO_2 concentration is obtained by multiplying the measured annual mean NO_2 concentration by the correction factor.

Factor from Local Co-location Studies (if applicable)

Not applicable for Ballymoney Borough Council

Discussion of Choice of Factor to Use

The Council does not operate a continuous analyser and therefore a co-location study has not been undertaken to determine a specific local bias adjustment factor. The national bias adjustment factor was therefore used. This is available on the Defra website (www.laqm.defra.gov.uk) spreadsheet version 07/13 and based on 34 studies for the preparation method 20% TEA in water during 2012 the overall correction factor was determined to be 0.97.

QA/QC of diffusion tube monitoring

Gradko Environmental analytical laboratory is assessed annually by UKAS to establish conformance of the Laboratory Quality Procedures to the requirements of ISO/IEC 17025 Standard and have demonstrated good precision results for 2012 as

detailed in the summary of precision results for the individual laboratories performance on the Defra website. A summary of precision results for nitrogen dioxide for 2008 – 2012 by laboratory is shown in appendix 3.
Gradko Environmental also demonstrated good performance in the WASP scheme for analysis of nitrogen dioxide diffusion tubes for October 2010 to September 2012.

Ballymoney Borough Council's QA/QC procedure is to ensure that diffusion tubes are handled and stored in accordance with the manufacturer's instructions. When a tube batch is received they are immediately placed in a refrigerator in the bag in which they are received. So far as is possible the Council conforms to the calendar of exposure periods. On the day of sampling they are removed from the fridge and installed. Laboratory blanks are retained in the fridge and are taken out only when the exposed tubes are being returned to the laboratory. When tubes are collected from sampling sites they are immediately packaged and sent to the laboratory for analysis.

Selection of Monitoring Sites

Monitoring sites are chosen to provide data on locations that appear to be representative of likely residential exposure and, where possible, are close to the nearest receptor to the busy road or road junction of interest. Where sites do not represent actual relevant public exposure they are located closer to the source than the nearest receptor. The sites are subject to periodic review and where sufficient data has been gathered, some of the diffusion tubes are relocated to new locations

Appendix 2 NO_2 Diffusion Tube Monthly Data for 2012

	Average NO2 Concentration							
	Location							
Month	1N	2N	3N	4N	6N	7N	8N	9N
January	25.17	16.95	9.67	11.67	22.95	21.34	30.95	21.67
February	24.95	17.34	11.17	10.98	24.95	22.33	31.75	18.25
March	26.65	15.95	10.08	12.43	28.82	25.94	31.69	19.45
April	28.75	25.13	9.61	11.11	18.37	22.01	33.44	20.98
May	20.75	19.21		7.51	18.35	20.16		14.22
June	26.02	20.71	7.47	7.50	23.11	22.00	30.23	15.26
July	18.17	16.52	5.12	6.64	21.27		25.49	12.73
August	22.54	18.45		6.81	27.56	22.23	25.53	11.77
September	20.11	12.83	5.63		25.05	19.84	28.54	19.13
October	29.50	23.45	11.02	13.29	31.02	27.22	38.51	21.40
November	33.59	18.44	11.67	14.35	33.03	29.96	40.35	22.66
December	34.29	23.07	16.86	17.75	38.95	33.17	36.60	22.61
Annual Mean	25.87	19.00	9.83	10.91	26.12	24.20	32.37	18.34
Annual Mean bias adjusted	25.10	18.43	9.54	10.59	25.34	23.47	31.40	17.79
% Data Capture	100	100	83	92	100	92	92	100