Derry City Council

Air Quality Review and Assessment: Progress Report

October 2008

An Agency within the Department of the Environment
www.doeni.gov.uk

Page

CONTENTS (i)

Appendices

Executive Summary

This progress report provides a review and update on air quality issues within Derry City Council area and includes new monitoring results and information on developments that may have an impact on air quality. The report should be read in conjunction with Derry City Council's Action Plan, dated September 2008 and the associated Dispersion Modelling report in Appendix 2 which details proposed traffic mitigation measures.

Updated monitoring results across the district show that the Air Quality Management Area (AQMA) at Creggan Road/Infirmary Road junction shall remain. Realisation of the measures detailed in the Action Plan will assist in redressing the raised pollutant concentrations at this location.

Continuous chemi-luminescent monitoring results for Nitrogen Dioxide (NO_2) do not indicate exceedence of the annual mean pollutant limit value at the Dale's Corner traffic junction in the District. However, NO_2 diffusion tube results at No.5 Glendermott Road at this junction indicate exceedences of the annual mean limit value. It is proposed to conduct advanced dispersion modelling at this location to determine if declaration of an AQMA is required.

Continuous monitoring results for Particulate Matter (PM_{10}) and Sulphur Dioxide (SO_2) at the Brandywell air-monitoring site show a sustained decrease in SO_2 levels, reflecting the continued decline in the use of solid fuel for home heating purposes. PM_{10} levels remain steady at this location, at around 50% of the annual mean limit value.

Trends at the background Automatic Urban and Rural Network monitoring station at Brooke Park demonstrate a small increase in NO_2 but general decrease in SO_2, PM_{10} and Carbon Monoxide (CO) concentrations. There is no clear trend with Ozone (O) concentrations although year to year variation is evident.

New local developments, which may have an impact on air quality, have been identified and listed in the report. These include proposed new major roads close to existing and new housing developments and also new industrial processes.

Chapter 1

1.1 Introduction

The preparation of air quality Progress Reports form part of the Local Air Quality Management (LAQM) system introduced under the Environment (NI) Order 2002. Progress Reports are designed to ensure continuity in the Local Air Quality Management process (LAQM).

All local authorities are required to produce a Progress Report in 2008. These reports are of value to local authorities in that they will assist Councils in responding to requests for up to date information on air quality, provide a means of communicating air quality information to members of the public and maximise the value of investment in monitoring equipment.

The Progress Report will also ensure that changing circumstances, requiring a detailed assessment, are identified early and acted upon.

To assist in writing the report, technical guidance LAQM.PRG (03) and draft LAQM.PRG (08) have been considered.

Chapter 2

2.1 New Monitoring Results

Derry City Council uses two types of monitoring methods to obtain data on air quality within the district. These are real time analysers and NO_2 passive diffusion tubes.

2.2 Real Time Analysis

Real time analysers are regarded as the most accurate method of monitoring pollutants. Derry City Council uses a range of electronic equipment positioned strategically throughout the Council District to maintain a continuous system of data collation for reporting purposes. A background monitoring station located at Brooke Park in the District is affiliated to the Automatic Urban and Rural Network (AURN). Until February 2008 the station continuously monitored Nitrogen Dioxide (NO_2), Sulphur Dioxide (SO_2), Carbon Monoxide (CO), Particulate matter (PM_{10}) and Ozone (O). Thereafter, CO monitoring ceased and a new suite of monitoring equipment was installed. The Brooke Park station now monitors NO_2, SO_2, Ozone, PM_{10} with FDMS upgrade and also $PM_{2.5}$ with FDMS upgrade. Appendix 1 illustrates annual monitoring trends at this site.

Results at the background station at Brooke Park demonstrate generally downward trends for most pollutants. There are slight increases in NO_2 and SO_2 for the last full year's data but this is not necessarily indicative of a general upward trend. There is no clear trend with Ozone (O) concentrations although year-to-year variation is evident.

The second real-time analyser is situated in the Brandywell area, where there was perceived to be significant use of solid fuel for home heating purposes. The pollutants monitored here are SO_2 and PM_{10} as these are associated with emissions from coal/solid fuel. Appendix 2.1 illustrates monitoring data for the last three full calendar years.

Continuous monitoring results for Particulate Matter (PM_{10}) and Sulphur Dioxide (SO_2) at the Brandywell show a sustained decrease in SO_2 levels, reflecting the continued decline in the use of solid fuel for home heating purposes. PM_{10} levels remain steady at this location, at around 50% of the annual mean limit value. Tables 2.1 and 2.2 illustrate the results for the last three years. Ug/m^3 denotes micrograms per cubic metre.

Table 2.1 Brandywell SO_2 Continuous Monitoring Results 2005 –2007

Year	Annual Hourly Mean µg m^{-3}	No. of Exceedences of 15-minute mean > 266 µg m^{-3}	No. of Exceedences of Hourly mean > 350 µg m^{-3}	No. of Exceedences of Daily mean > 125 µg m^{-3}	% Data Capture
2005	6	0	0	8	98.8
2006	5	0	0	0	98
2007	3	0	0	0	98.3

Table 2.2 Brandywell PM_{10} Continuous Monitoring Results 2005 –2007

Year	Annual Hourly Mean µg m^{-3}	No. of Exceedences of PM_{10} Particulate Matter (Gravimetric) Daily mean > 50 µg m^{-3}	No. of Exceedences of PM_{10} Particulate Matter (Gravimetric) Annual mean > 40 µg m^{-3}	% Data Capture
2005	19	0	0	98.8
2006	21	8	0	98
2007	21	6	0	98.3

A third continuous analyser is located at kerbside at a busy road in Dale's Corner in the Waterside area of the District. This is one of the main traffic junctions on the approach to the city and several residential buildings are in close proximity to traffic sources. This monitoring station measures NO_2, which is one of the main pollutants associated with exhaust emissions. Appendix 2.2 shows continuous monitoring results for the last three years for this site.

Table 2.3 Dale's Corner NO_2 Continuous Monitoring Results 2005 –2007

Year	Annual Mean	No. of Exceedences of Annual mean > 40 µg m^{-3}	No. of Exceedences of Hourly mean > 200 µg m^{-3}	% Data Capture
2005	62	1	8	81.4
2006	37	0	1	67.2
2007	39	0	0	88.7

Monitoring results for Nitrogen Dioxide (NO_2) indicated an exceedence of the annual mean in 2005 with 8 exceedences of the hourly mean compared to the

permitted 18 exceedences per year. The last full year's data has shown no exceedences. Table 2.3 above summarises results for the last three years.

Derry City Council commissioned Bureau Veritas to investigate if AQMA declaration was required at this junction, based on continuous monitoring results. The 2007 Detailed/Further Assessment Technical Report - BV/AQ/AGG0813/EC/2486, based on predictive dispersion modelling, concluded that declaration was not necessary. However, subsequent diffusion tube results at a location near this junction have shown exceedences of the limit value and further modelling is now proposed (discussed later).

Derry City Council has also located a portable TEOM PM_{10} monitor at different locations of relevant public exposure over the last few years. The results of the 6-month monitoring survey, conducted from July 2006 to February 2007 at no. 24 Ballyartan Road, Claudy, a residential location near to sand extraction quarries, were disclosed in the Detailed Assessment Report Update of November 2007.

This continuous TEOM monitor is now located at a residential location at Culmore Point Road, opposite the Londonderry Port and Harbour. There has been a history of dust complaints from residents, particularly from unloading activities that are not governed by Pollution Prevention and Control permitting requirements. A twelve-month monitoring survey began at this location in December 2007. Results until July 2008 are detailed in Appendix 2.3. The projected annual mean for this period was found to be half the limit value of $40ug/m^{-3}$.

Data for all continuous monitoring stations, including site photographs and locations as well as current and historical statistics and graphs, can be found at the Northern Ireland Air Quality website at: - http://www.airqualityni.co.uk/

2.2.1 Quality Assurance/Quality Control (QA/QC)

To ensure that the information obtained from the analysers is as accurate as possible and to quantify any instrument drifts, a stringent QA/QC protocol is followed. AEA Energy and Environment undertakes this contract for Derry City Council at all the automatic monitoring sites. They ensure that the measurements from the analysers are representative and inter-comparable.

The audits act as an independent check on system performance and any site-specific problems that may have remained undetected will be fully documented. Details of calibration certificates and associated QA/QC documentation are available on request.

2.2.2 Manual Calibration of continuous monitors

Every two weeks manual calibration checks are carried out by Council officers on all continuous monitors. This allows the instrument drifts to be fully quantified and

documented using traceable calibration gas standards and the results are used to scale data. All calibration records are sent to AEA Energy and Environment who conduct the QA/QC checks.

2.2.3 Six Monthly Checks

Our analyser suppliers, Enviro Technology Ltd, carry out these checks at the same time as they service the equipment. Any site-specific problems that may have remained undetected will be fully quantified. All reports are furnished to AEA Energy and Environment.

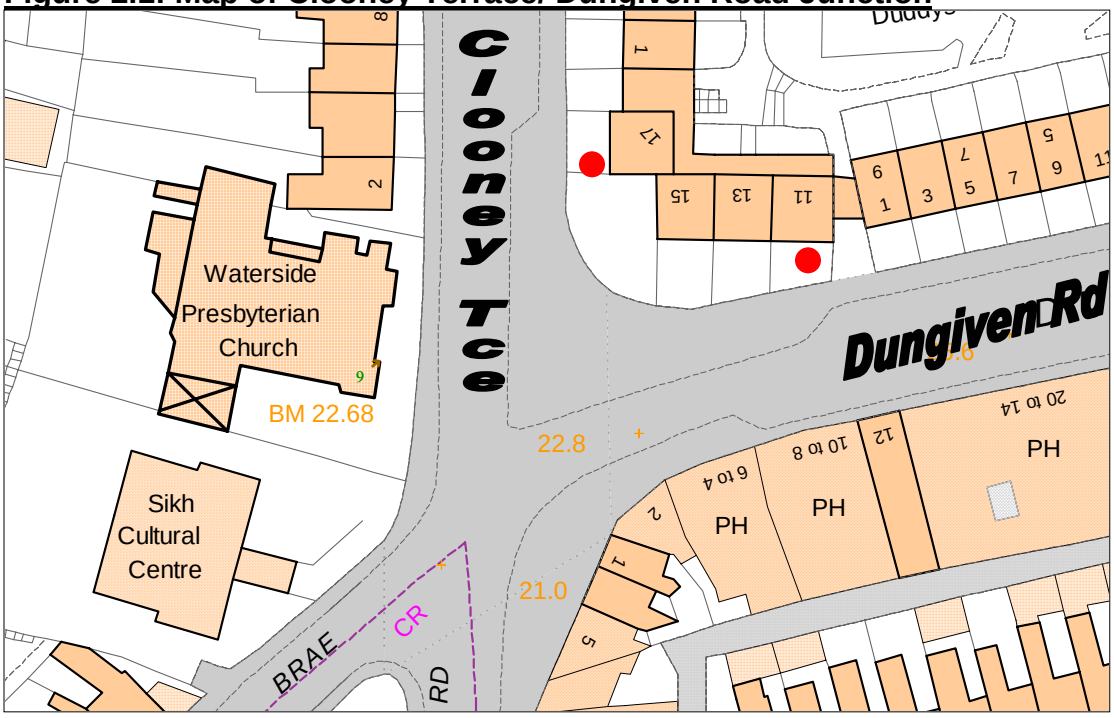
2.3 Nitrogen Dioxide Diffusion Tubes

Derry City Council uses diffusion tubes prepared and analysed by Bureau – Veritas' laboratory. The laboratory participates in the field inter-comparison scheme and WASP programmes and these accreditations assist in assessing the performance of the laboratory.

An extensive network of diffusion tubes has been established at key locations where people live close to traffic sources throughout the Council District.

The 2006 Updating and Screening Assessment report identified two locations where further assessment would be required. Derry City Council is proposing to install diffusion tubes at the first location - Dungiven Road/Clooney Terrace /Spencer Road junction as below. These receptors have been chosen as traffic lights are situated close-by and queuing occurs throughout the day at these links.

Figure 2.1: Map of Clooney Terrace/ Dungiven Road Junction



Diffusion tubes have been installed at the second location of concern, Abercorn Road/Bishop Street (see Appendix 3: Abercorn Road). Results are tabulated below. Pollutant concentrations at both receptors are under the limit value. However, monitoring will continue due to elevated levels at no.63 Abercorn Road

Table 2.4: Nitrogen dioxide monitoring results for Abercorn Road for the period June 2007 – May 2008

Month	**Nitrogen Dioxide concentration (ug/m^3)** No.8 Abercorn Road	**Nitrogen Dioxide concentration (ug/m^3)** No. 63 Abercorn Road
June 2007	21	32
July	37	1
August	29	--*****
September	27	--
October	30	58
November	45	48
December	25	49
January 2008	--	--
February	40	49
March	42	42
April	41	43
May	39	43
Total	356	365
Average	34.2 ug/m^3	40.6 ug/m^3
Corrected Average Annual mean value**	**31.3**	**37.2**

***** denotes missing data

****** Analysis service provided by Bureau Veritas, most recent bias correction factor for 2007 of 0.917

There are also three main traffic junctions of concern in the main arterial into the city. A number of tubes have been strategically positioned at these junctions to give long-term annual average concentrations. All diffusion tube monitoring sites can be seen in Appendix 3.

Six tubes are distributed within the Air Quality Management Area (AQMA) at the Creggan Road/Infirmary Road junction to determine the spread of pollutant concentration. All diffusion tubes are positioned at locations of relevant public exposure on building facades at/near kerbside.

Tables in Appendix 4 show the annual average concentrations of nitrogen dioxide at each of the sites for the years 2006- 2008. It should be noted that two different laboratories were used in 2006 and annual means cannot therefore be directly collated. A bias correction factor was obtained from the co-location spreadsheet database available on the University of the West of England AQM Resource Centre website. The most recent (2007) overall factor for 11 collocation studies that use Bureau-Veritas was 0.917.

Apart from the exceedences indicated at Creggan Road, which is within Derry's only AQMA, one other site requires further assessment. NO_2 diffusion tube results at No.5 Glendermott Road at the Dale's Corner junction indicate exceedences of the annual mean limit value. A map of this location is detailed in Appendix 3. This road has undergone dualling in the last 2 years with subsequent growth in traffic volumes. Table 2.5 below summarises results for the last number of years. Also, the site at No.4 Ebrington Terrace, commenced in January 2008 and some 40 metres distance from No.5 Glendermott Road on an adjacent building block, is also showing exceedence of the annual NO_2 mean, albeit only 8 months data is available to date for this site. Due to the elevated levels at this junction, it is proposed to conduct further dispersion modelling to determine if declaration of an AQMA is required.

Table 2.5 Annual Mean NO_2 Diffusion Tube Results in ug/m^{-3} for no. 5 Glendermott Road, Dale's Corner junction

Year	2005	2006	2007	2008
5 Glendermott Road	42 *	34 **	45	53 +

*Analysis service provided by Lambeth Scientific Service laboratory, high bias correction factor of 1.24

** Analysis service provided part year by Lambeth Scientific, part year by Bureau Veritas. As annual mean unable to be determined directly, calculation based on the annualisation of the 6-month Bureau Veritas data period October 2006 – March 2007, as detailed in previous Technical Report BV/AQ/AGG0813/EC/2486.

+ Based on 8 months data, January – August with a bias correction factor of 0.917

Finally, 2 diffusion tubes, one at 19 St Patrick's Terrace, the other at 5 Collon Terrace, are showing exceedences for the period January to August 2008(See Appendix 4.3). Derry City Council will continue to closely monitor pollutant concentrations at these locations.

Chapter 3

3.1 New Local Developments

This section of the report looks at changes that have taken place that may affect air quality as well as looking at major developments under consideration.
The areas considered include new industrial processes included in the list in appendix 2 of TG (03) and new developments with an impact on air quality, especially those that will significantly affect traffic flows. There is one proposed new landfill site.

Table 5.1 in Appendix 5 shows summary information on all new developments.

3.2 New Part A Processes

There are 4 new/proposed Part A processes in Derry City Council District. These are regulated by the Industrial Pollution and Radiochemical Inspectorate (IPRI) of the Northern Ireland Environment Agency (NIEA) or the Land and Resource Management Unit (LRMU) for landfill sites.

Foyle Meats

The Foyle Meats/Proteins plant discussed in the 2005 Progress Report transferred from a Part C to a Part A process on 25/08/2006. The permit covers animal slaughter, meat processing and rendering activities. The principal point source emissions of possible concern from the site are Particulates including (PM_{10}), Sulphur Dioxide (SO_2), Oxides of Niitrogen (NO_x) and Carbon Monoxide (CO) from the boiler and thermal oxidizer. Other emissions to air have been deemed insignificant. Emissions reduction is achieved through regular maintenance via Planned Preventative Maintenance (PPM), use of low sulphur fuel and low NO_x burner. It is concluded that this operation also is not highlighted as a process likely to release significant quantities of the specified substances to air as stated in appendix 2 of LAQM.TG (03).

Coolkeeragh ESB Ltd

Application was made in July 2006 to IPRI. The main activity comprises the combustion of natural gas or distillate oil in a 400MW combined cycle gas turbine (CCGT) plant to produce electricity for supply to the grid. The installation also includes a 60MW open cycle gas turbine (OCGT) power plant fired on kerosene or distillate oil, which generates electricity during periods of peak demand. There was formerly a coal-fired power station at this location.

Detailed air dispersion studies were undertaken to determine acceptable stack heights. It was found that a height of 70m for the CCGT and 35m for the OCGT achieved acceptable ground level pollutant concentrations.

Invista Textiles UK LTD

The activities at the installation are the generation of steam and electricity in a coal fired power plant and the manufacturing of synthetic fibre Lycra. The 2 activities were formerly regulated under the Industrial and Pollution Control (NI) Order 1997.

The Cogen plant consists of 2 travelling grate coal fired boilers each rated at 39.8 MW and one oil-fired unit at 32.5MW. The permit for the Cogen plant was varied from January 2008 to ensure compliance with the requirements of the UK National Emissions Reduction Plan (NERP) established to comply with Council Directive 2001/80/EC.

Du Pont Landfill

Application has been made by Du Pont (UK) Industrial Ltd Maydown Works for a non-hazardous landfill site. The landfill consists of three cells. Cell one is complete, cell two has less than 1000 cubic metres of void space remaining and cell three will have a void space of 12,000 cubic metres.

3.3 New Part B Processes

There is one new/proposed Part B processes in Derry City Council District

LSS Ltd, Carrakeel

Application has been made for this Oil Storage and Distribution terminal on 2.3 hectares of ground near to Lough Foyle. The total proposed storage is 16,000 tonnes of petroleum spirit, 16000 tonnes of diesel, 20,000 tonnes of gas oil and 24,000 tonnes of kerosene.

3.4 New Part C Processes

Eight new /proposed Part C processes have been identified in the District.

- **Eglinton Timber** manufactures timber pallets. A permit was issued on 09/05/06 for the company to operate an installation for the combustion of solid waste in an appliance between 0.4 and 3MW rated thermal input. The premises are in close proximity to existing and proposed housing on

two sides. Although there is potential for release of Particulate matter and Carbon Monoxide, the only pollutants relevant to the Air Quality Review and Assessment regime in this case, stringent permitting conditions will minimise/ effectively control potential emissions.

- **Perfecseal Ltd** was permitted on 02/04/06. The company undertakes the coating process of printing flexible packaging. The premises are in an industrial setting, close to an isolated residential area. It is accepted that the permit conditions will control any Carbon Monoxide or Oxides of Nitrogen emissions associated with the operation of this process.

- **Flemmings Engineering** was permitted on 22/06/07. The company undertakes the coating of metal and plastic in an agricultural context. The premises are in an industrial setting, but close to isolated residential areas.

- **Foyle Dry Cleaners, Prestige Dry Cleaners and Smooth Operators Dry Cleaners** were permitted by September 2007.

- **Brown and Mason Ltd** has applied to Derry City Council for a permit to install a crushing machine for the grinding of bricks/concrete at Coolkeeragh Power Station.

For all of the Part A, B and C processes listed, it is envisaged that stringent permitting conditions will minimize/ effectively control potential emissions to air.

3.5 New Road Schemes

Major new road schemes that may have an impact on air quality are listed below.

3.5.1 New Skeoge Link Road, Galliagh, Derry City Council

This scheme is now complete. Before final approval, the Environmental Health Department requested that air quality dispersion re-modelling be undertaken due to uncertainty over baseline traffic figures and the potential effect on predicted pollutant concentrations at areas of relevant public exposure, particularly where residential units are proposed in close proximity to roundabouts where traffic will be slowing down. This was done and it was found that no pollutant exceedences were predicted.

This link road is effectively a ring road around this part of the city. Large residential developments are proposed on both sides of the road. The Environmental Health Department will continue to review and assess air quality at this location to take account of increasing traffic volumes.

3.5.2 A2 Buncrana Road Improvements

The Regional Strategic Transport Network Transport Plan (RSTN TP) 2015 includes for the improvement of the A2 Buncrana Road, Derry between the Pennyburn Roundabout and the Border with the Irish Republic. Buncrana Road is part of the North Western Key Transport Corridor connecting Belfast to Londonderry and on to Donegal. The Buncrana Road carries around 17,000 vehicles per day 2-way on the urban section with peak traffic approaching 1400 vehicles per hour in the afternoon peak. The busiest section of the road – Pennyburn Roundabout to Springtown Road suffers from traffic congestion and delays occurring at peak periods on every weekday. The rural section of the road carries around 14,000 vehicles per day 2-way.

The proposal would improve traffic flows on Buncrana Road by widening the 4.5 kilometres of single lane carriageway to achieve 2 traffic lanes in each direction between Pennyburn Roundabout and the border. The carriageway widening may mostly be on line but consideration is to be given to partial off-line at the eastern end of the corridor between Pennyburn Pass and Racecourse Road or Springtown Road.

Four potential route options are currently being explored with full public consultation throughout the process. Consultants have been appointed to fully assess the impact of all National Air Quality Strategy pollutants at all relevant areas of relevant public exposure. Construction is not scheduled until 2016. Details of the scheme can be found at :-

http://roadimprovements.roadsni.gov.uk/index/futureschemes/a2_buncrana_road_londonderry_pennyburn-skeoge.htm

3.5.3 A2 BroadBridge Maydown to City of Derry Airport Dualling

The A2 forms part of the Northern Key Transport Corridor linking the Belfast Metropolitan Area to Londonderry via Coleraine. The existing corridor is a mixture of motorway, dual and single carriageway. The section of the A2 under consideration is one of several schemes that have been identified for the northern corridor in the Regional Strategic Transport Network Transport Plan 2015 (RSTN TP).

The proposed scheme consists of the provision of 6.2 km of dual carriageway. Between Maydown and Campsey, the improvement is predominately online with the section east of Campsey being predominately off line.

The busiest section of the road, Maydown to Broadbridge, already carries flows in excess of 21,000 vehicles per day while the section between Broadbridge and the City of Derry Airport carries about 14,000 vehicles per day. Congestion and delays occur at peak periods on every weekday and at other times throughout the week.

It is expected that traffic levels will continue to grow with the anticipated expansion of the airport and local industry, resulting in increased traffic congestion.

DRD Roads Service states that traffic related pollutants are expected to increase slightly in line with traffic growth. The increase is attributable to increased travel distance, the introduction of new road links, the closure of dangerous junctions and the resulting redistribution of traffic flows along the proposed route. Predicted levels are not expected to exceed the criteria required by the National Air Quality Standard at any location within the scheme. The proposed scheme will have an insignificant effect on regional emission levels. The Environmental Health Department will make assessment of all associated air quality reports.

Details of the scheme can be found at :-

http://roadimprovements.roadsni.gov.uk/index/schemes/broadbridge.htm

3.5.4 A5 Western Transport Corridor (WTC)

The A5 Western Transport Corridor is one of five key transport corridor upgrades identified in the Regional Transportation Strategy (RTS) for Northern Ireland and represents a significant link in longer-term plans to improve connections between Dublin, the City of Derry and Donegal.

The A5 WTC scheme is anticipated to be a dual carriageway construction stretching from the border near Aughnacloy to Londonderry. The current A5 is primarily a single carriageway over its total length and the road passes through a number of built up areas. The road currently serves both strategic and local traffic with traffic flows along the route varying from approximately 8,000 to 19,000 AADT.

The scheme is scheduled for construction in 2012. Details of the scheme can be found at :-

http://www.a5wtc.com/Default.aspx

The air quality assessment will include gathering and assessing information relating to local air quality and emissions of pollutants. Air Quality receptors (such as schools and residential areas) will be identified and an air quality model will be used to predict the potential changes to air quality as a result of the road.

3.5.5 A6 Londonderry to Dungiven Dualling Scheme

Department of Regional Development (DRD) Roads Service (NI) has examined strategies for future improvement of the A6 road corridor between the Castledawson Roundabout and Londonderry. Dualling of the 30 kilometre

western part of the corridor between Londonderry and Dungiven, including a dual carriageway bypass of Dungiven has been added to the Department for Regional Development's 'Regional Strategic Transport Network Transport Plan 2015'.

DRD Roads Service is now examining potential routes for the dual carriageway within the Derry Dungiven corridor. The scheme would lead traffic onto a 30 kilometre long dual carriageway starting east of Derry close to the Caw Roundabout and connecting to the existing A6 Glenshane Road east of Dungiven.

In general, within Derry City Council district, the new road would comprise:

- 5.3 kilometres of dual carriageway cross country between Caw Roundabout and Drumahoe.
- 22.4 kilometres of dual carriageway closely following the existing A6 corridor between Drumahoe and Dungiven.

Junctions at Caw roundabout, Drumahoe and either side of Dungiven would connect the new road to the existing road network. Details of the scheme can be found at :-

http://roadimprovements.roadsni.gov.uk/index/schemes/londonderry-dungiven/derry-dungiven-2.htm

Derry City Council is working closely with various environmental consultants who have been appointed to fully assess the impact of all National Air Quality Strategy pollutants at all relevant areas of relevant public exposure for the above proposed road schemes.

3.6 New mixed use developments (residential /commercial)

New mixed-use development schemes that may have an impact on air quality are listed below.

3.6.1 Residential, Retail and Leisure Development, Crescent Link, Waterside, Derry.

This scheme was reported in Derry City Council's previous Progress report in 2005 and is now at mid-construction phase. This is a large development with residential forming the major component. All domestic properties in the proposed development have/will have oil-fired central heating or natural gas for home heating purposes. Schemes of this size would have the potential to exceed PM_{10} air quality limit values should there have been extensive use of solid fuel (even smokeless).

3.6.2 Proposed Housing and Associated Facilities for New Residential Neighbourhood at lands between Upper Galliagh Road, Beragh Hill Road and Skeoge Road.

This scheme was also reported in Derry City Council's previous Progress report in 2005. There have been planning delays associated with it due to the size of the development and the first units of housing are currently being built.

As above, all domestic properties in the proposed development will have oil-fired central heating or natural gas for home heating purposes.

3.6.3 Draft Masterplans for Fort George and Ebrington

The urban regeneration company Ilex-URC has been appointed to oversee the re-development of two former military bases of Ebrington (26 acres) and Fort George (14 acres). Mixed-use development is envisaged for both sites and revitalisation of the riverfront is a key objective.

For the Fort George site, the land uses proposed are as follows:
- Knowledge Economy - 222,000 sq ft
- Office - 532,000 sq ft
- Residential - 222 apartments
- Live/Work - 112 units
- Hotel - 150 beds
- Retail/cafes/bars/restaurants - 50,000 sq ft

This scheme is the largest proposed mixed-use development the city has seen to date and is at the Masterplan stage, prior to full planning application. It is a completely new-build scheme. Potential effects to existing air quality include choice of heating/power and increased localised traffic emissions affecting existing and proposed residential receptors. The developers are considering a range of sustainable power sources including gas, biomass, building-integrated wind turbines, ground heat pumps and solar. Derry City Council Environmental Health Department has requested that assessment be made, using an appropriate air quality dispersion model, of all National Air Quality strategy pollutant concentration emissions from current and future traffic sources in the nearby road network in all locations where there is deemed to be relevant public exposure. These proposals can be seen at :-
http://www.ilex-urc.com/uploads/File/fg_draft_masterplan.pdf

Figure 4.1 gives an indication of the scale of the proposals.

Figure 4.1: Proposals for the former Fort George Complex at Strand Road

For the Ebrington site, the proposed scheme is part new-build with retention of many listed buildings. This scheme is also at Masterplan stage, prior to application for planning permission. There are proposals for commercial offices, leisure, cultural, community, residential and retail. Similar consideration will be given to sustainable power sources as for the Fort George Scheme. Derry City Council will also request appropriate air quality reports for consideration of traffic pollutant emissions. The Ebrington scheme will not be in the scale of that at Fort George but still has the potential to affect emissions to air. These proposals can be seen at :-
http://www.ilex-urc.com/uploads/publications/Ebrington Masterplan.pdf

Figure 4.2 illustrates these proposals.

Figure 4.2: Proposals for the former Ebrington Barracks Complex at Limavady Road/King Street

Chapter 4

4.1 Action Plan

An Order designating an Air Quality Management Area at the Creggan Road/Infirmary road junction was passed on 23 February 2005, in accordance with LAQM requirements. Derry City Council subsequently produced a draft Action Plan, followed, currently, by the final Action Plan, which is now awaiting ratification by DoE (Northern Ireland)

Previously, air quality consultants Bureau Veritas were commissioned to undertake source apportionment work as part of the Further Assessment Report (2007). It was found that heavy-goods vehicles and buses were the main contributors of the total NO_2 concentrations measured in the AQMA, followed by cars and taxis.

Derry City Council has subsequently worked with the Department for Regional Development (Roads Service) to identify potential traffic measures that could be implemented in the AQMA to reduce NO_2 levels. It was established that further modelling was required to help quantify the impact of these measures on the pollutant levels in the AQMA. This modelling report is appended to the final Action Plan.

Four scenarios were tested using the ADMS-Urban dispersion model and a fifth scenario, although not modelled, was also considered:

- Scenario 0 - Baseline scenario, based on the current traffic conditions (2007) in the AQMA;
- Scenario 1 - Removal of heavy duty vehicles (HDV's) in the AQMA (including buses and heavy goods vehicles – HGV's);
- Scenario 2 - 5% decrease of the overall traffic in the AQMA (all types of vehicles);
- Scenario 3 - Combination of Scenario 1 and Scenario 2;
- Scenario 4 - Removal of HDV's on Creggan Road only - assuming that a significant part of the HDV's previously using Creggan Road would be diverted before reaching the AQMA.
- Scenario 5 - Combination of Scenario 2 and Scenario 4;

It was agreed that Scenario 5 would appear to be the preferred option as part restriction of HDV's on Creggan Road is more practicable and achievable than a restriction at all links. In combination with Scenario 2, a 5% reduction in overall traffic flows at the junction, NO_2 concentrations in the AQMA should significantly decrease with predicted results showing that all sensitive receptors (façade of properties) should be below the NO_2 annual mean Air Quality Standard objective of 40ug/m3, reducing annual concentrations by 25% to 35%.

The DRD Roads Service (NI) are proposing to use their powers under the Road Traffic Regulation (NI) Order 1997 to pass a Traffic Route Restriction Order, imposing a weight restriction to limit HDV access to local deliveries only. There will be a period of public consultation before passing of the Order. Roads Service are also proposing to strategically locate signage on approaches to the junction in order to voluntarily divert traffic away from the junction by making other routes more attractive.

Derry City Council has included Scenario 5 as the first and potentially most important Measure in its Action Plan. However, it is realistic to acknowledge that there will be access for HDV deliveries within the AQMA and the 5% overall traffic reduction will, to some extent, be down to the good will of drivers, choosing alternative suggested routes. It is therefore important that other Measures in the Action Plan such as the Alternative Travel Plan, encouraging residents in the AQMA to use alternative travel options, car-sharing, and incorporation of sustainable policies in the local Transport Plan, among others, are progressed and implemented.

CHAPTER 5

5.1 Conclusions

The AQMA at the Creggan Road/Infirmary Road junction is Derry City Council's only current AQMA and the implementation of the Action Plan, in collaboration with relevant bodies, is currently underway. Dispersion modelling of traffic scenarios has shown that part restriction of HDV's on Creggan Road in combination with a 5% reduction in overall traffic flows at the junction, should result in a significant decrease in pollutant concentrations with predictions showing that all sensitive receptors (façade of properties) should be below the NO_2 annual mean Air Quality Standard objective of 40ug/m^3. This is a priority measure in the Action Plan.

Derry City Council however, acknowledges the importance of other measures in the Action Plan such as the Alternative Travel Plan, encouraging residents in the AQMA to use alternative travel options such as car-sharing and incorporation of sustainable policies in the local Transport Plan, among others, to ensure that NO_2 pollutant exceedences are redressed.

At the Dale's Corner traffic junction in the District, continuous chemi-luminescent monitoring results for Nitrogen Dioxide (NO_2) do not indicate exceedence of the annual mean pollutant limit value. However, NO_2 diffusion tube results for 2007 and 2008 at No.5 Glendermott Road at this junction, indicate exceedences of the annual mean limit value. It is proposed to conduct advanced dispersion modelling at this location to determine if declaration of an AQMA is required.

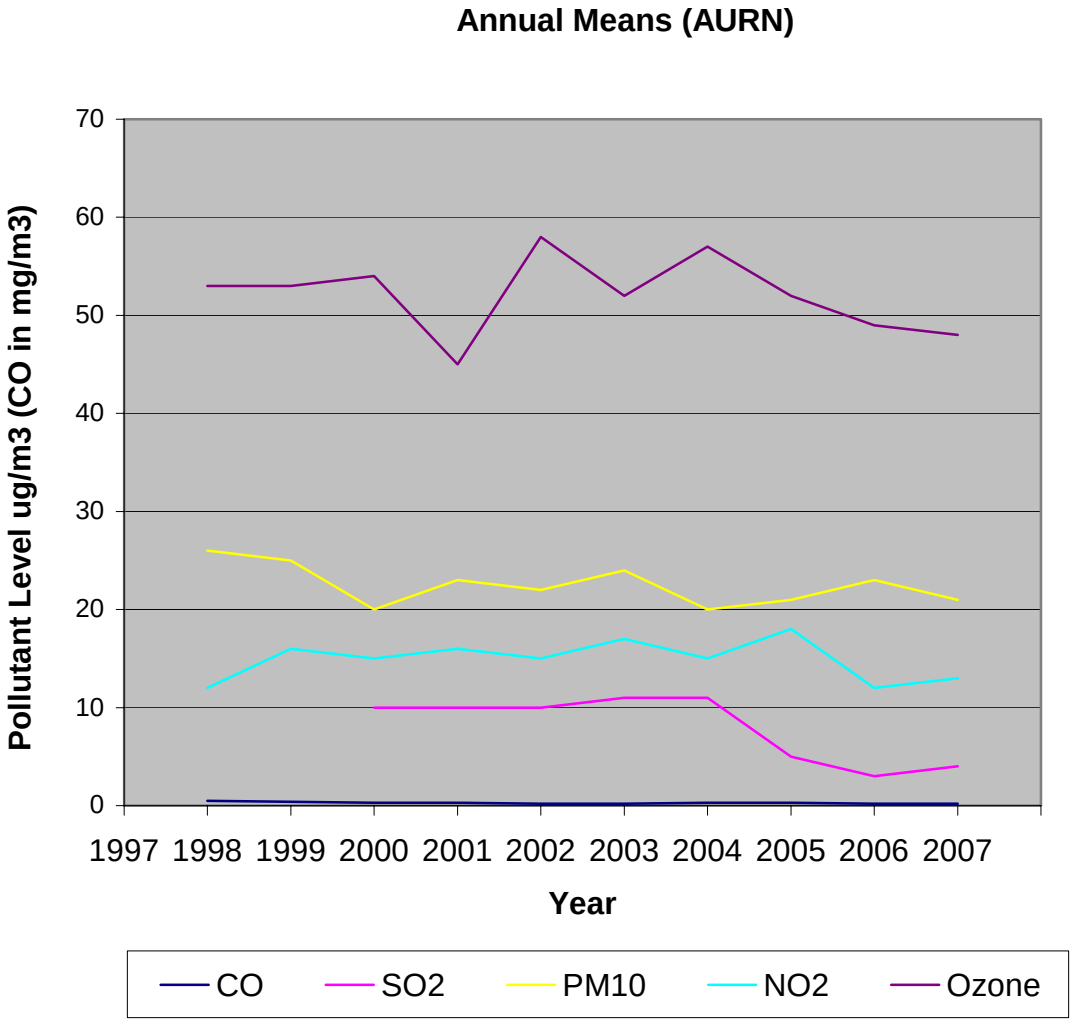
Continuous monitoring results for Particulate Matter (PM_{10}) and Sulphur Dioxide (SO_2) at the Brandywell air monitoring site show a sustained decrease in SO_2 levels, reflecting the continued decline in the use of solid fuel for home heating purposes. PM_{10} levels remain steady at this location, at around 50% of the annual mean limit value.

Trends at the background Automatic Urban and Rural Network monitoring station at Brooke Park demonstrate a small increase in NO_2 but general decrease in SO_2, PM_{10} and Carbon Monoxide (CO) concentrations. There is no clear trend with Ozone (O) concentrations although year to year variation is evident.

New mixed-use developments, road schemes and industrial processes are listed and any associated air quality issues will be addressed accordingly.

Appendix 1:

Figure 1: Graph showing Annual Mean Pollutant Concentrations at Brooke Park Urban Background Air Quality Monitoring Station 1997 - 2007



Appendix 2.1:

BRANDYWELL AIR MONITORING STATION

Pollutant Concentrations (SO_2 and PM_{10}) at Brandywell Air Quality Monitoring Station, 2005

Produced by AEA Energy & Environment on behalf of Derry CC

DERRY BRANDYWELL
01 January to 31 December 2005

These data have been fully ratified by AEA Energy & Environment

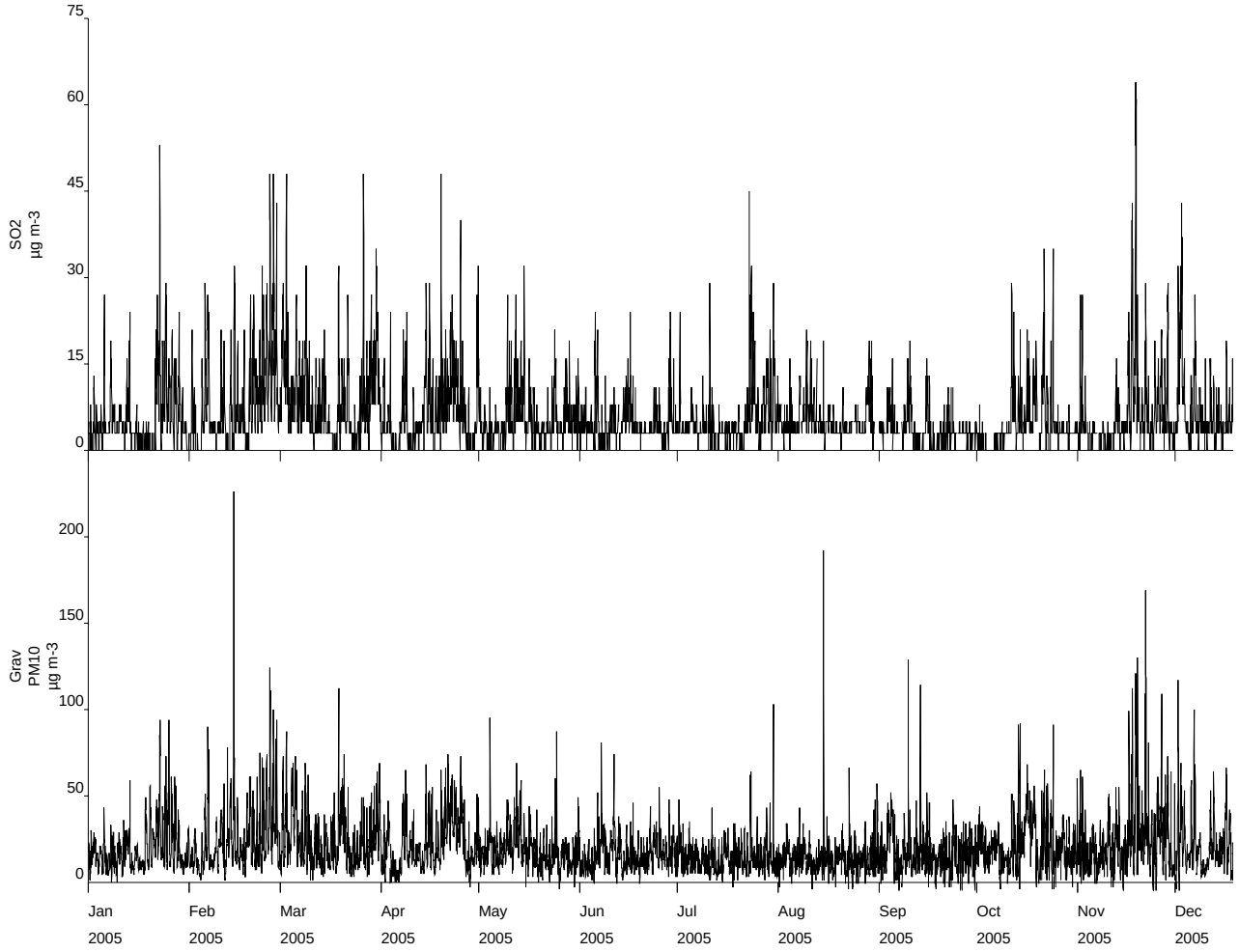
POLLUTANT	SO_2	PM_{10}*+
Number Very High	0	0
Number High	0	0
Number Moderate	0	0
Number Low	33658	8730
Maximum 15-minute mean	101 µg m^{-3}	226 µg m^{-3}
Maximum hourly mean	64 µg m^{-3}	226 µg m^{-3}
Maximum running 8-hour mean	46 µg m^{-3}	98 µg m^{-3}
Maximum running 24-hour mean	26 µg m^{-3}	57 µg m^{-3}
Maximum daily mean	22 µg m^{-3}	45 µg m^{-3}
Average	6 µg m^{-3}	19 µg m^{-3}
Data capture	97.2 %	98.8 %

+ PM_{10} as measured by a TEOM with a factor of 1.3 applied to give Indicative Gravimetric Equivalent concentrations
All mass units are at 20'C and 1013mb

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
Sulphur Dioxide	15-minute mean > 266 µg m^{-3}	0	0
Sulphur Dioxide	Hourly mean > 350 µg m^{-3}	0	0
Sulphur Dioxide	Daily mean > 125 µg m^{-3}	0	0
PM_{10} Particulate Matter (Gravimetric)	Daily mean > 50 µg m^{-3}	0	0
PM_{10} Particulate Matter (Gravimetric)	Annual mean > 40 µg m^{-3}	0	-

Produced by AEA Energy & Environment on behalf of Derry CC

Derry Brandywell Air Monitoring
Hourly Mean Data for 01 January to 31 December 2005



For further information on air pollution monitoring please don't hesitate to contact:

David Madle
Environmental Quality
AEA Energy & Environment
Building 551.11
Harwell
Didcot
Oxfordshire
OX11 0QJ

Direct line 0870 190 6523
Direct facsimile 0870 190 6377
e-mail David.Madle@aeat.co.uk

Pollutant Concentrations (SO_2 and PM_{10}) at Brandywell Air Quality Monitoring Station, 2006

Produced by AEA Energy & Environment on behalf of Derry CC

DERRY BRANDYWELL
01 January to 31 December 2006

These data have been fully ratified by AEA Energy & Environment

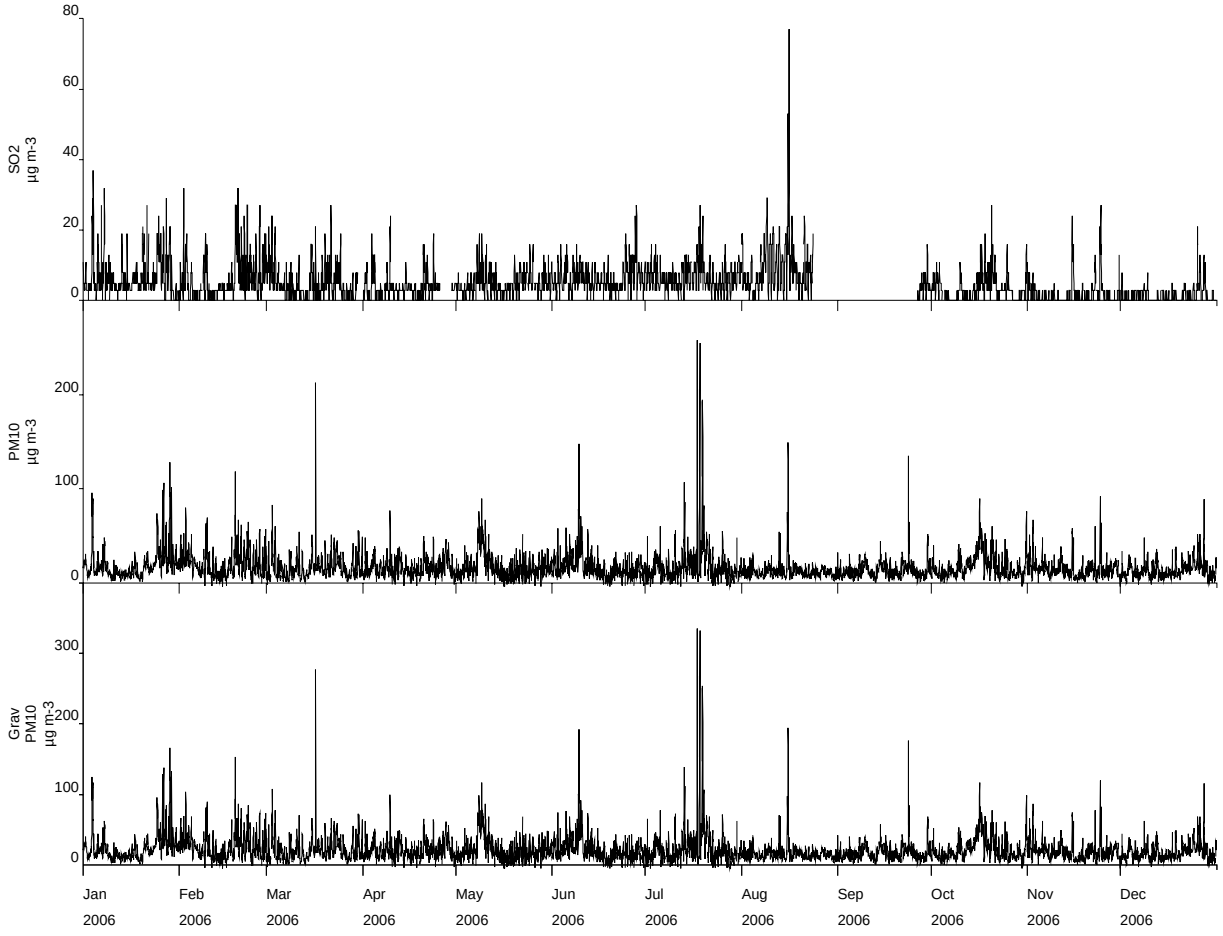
POLLUTANT	SO_2	PM_{10}+	PM_{10}*+
Number Very High	0	0	-
Number High	0	2	-
Number Moderate	0	52	-
Number Low	30016	8678	-
Maximum 15-minute mean	93 µg m^{-3}	258 µg m^{-3}	335 µg m^{-3}
Maximum hourly mean	77 µg m^{-3}	258 µg m^{-3}	335 µg m^{-3}
Maximum running 8-hour mean	41 µg m^{-3}	136 µg m^{-3}	177 µg m^{-3}
Maximum running 24-hour mean	25 µg m^{-3}	75 µg m^{-3}	98 µg m^{-3}
Maximum daily mean	22 µg m^{-3}	65 µg m^{-3}	85 µg m^{-3}
Average	5 µg m^{-3}	16 µg m^{-3}	21 µg m^{-3}
Data capture	86.7 %	98.0 %	98.0 %

* PM_{10} indicative gravimetric equivalent
+ PM_{10} as measured by a TEOM
All mass units are at 20'C and 1013mb

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
Sulphur Dioxide	15-minute mean > 266 µg m^{-3}	0	0
Sulphur Dioxide	Hourly mean > 350 µg m^{-3}	0	0
Sulphur Dioxide	Daily mean > 125 µg m^{-3}	0	0
PM_{10} Particulate Matter (Gravimetric)	Daily mean > 50 µg m^{-3}	8	8
PM_{10} Particulate Matter (Gravimetric)	Annual mean > 40 µg m^{-3}	0	-

Produced by AEA Energy & Environment on behalf of Derry CC

Derry Brandywell Air Monitoring
Hourly Mean Data for 01 January to 31 December 2006



For further information on air pollution monitoring please don't hesitate to contact:
David Madle
Environmental Quality
AEA Energy & Environment
Building 551.11
Harwell
Didcot
Oxfordshire
OX11 0QJ

Direct line 0870 190 6523
Direct facsimile 0870 190 6377
e-mail David.Madle@aeat.co.uk

Pollutant Concentrations (SO_2 and PM_{10}) at Brandywell Air Quality Monitoring Station, 2007

Produced by AEA Energy & Environment on behalf of Derry CC

DERRY BRANDYWELL
01 January to 31 December 2007

These data have been fully ratified by AEA Energy & Environment

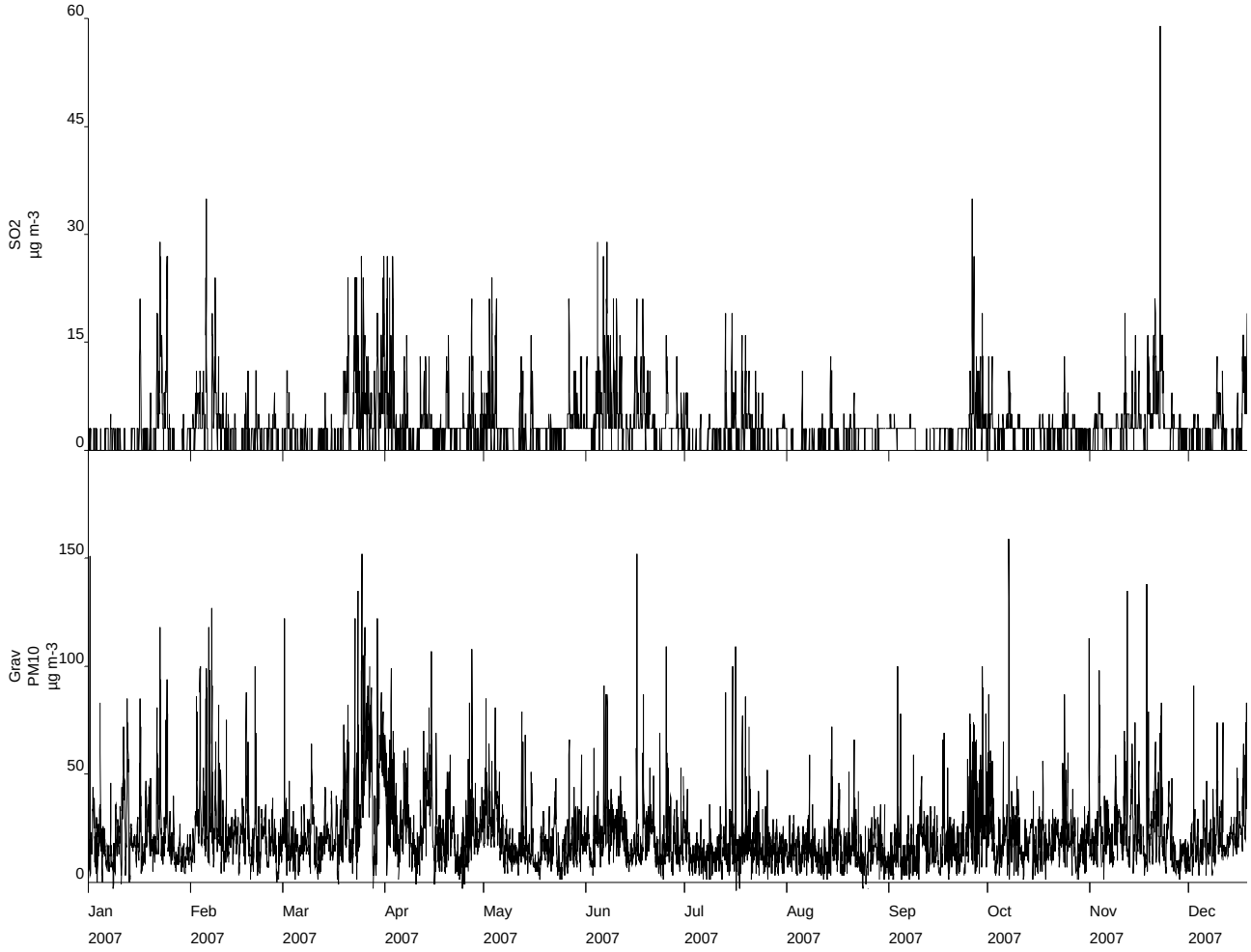
POLLUTANT	SO_2	PM_{10}*+
Number Very High	0	0
Number High	0	0
Number Moderate	0	55
Number Low	33838	8645
Maximum 15-minute mean	104 µg m^{-3}	183 µg m^{-3}
Maximum hourly mean	59 µg m^{-3}	183 µg m^{-3}
Maximum running 8-hour mean	25 µg m^{-3}	95 µg m^{-3}
Maximum running 24-hour mean	19 µg m^{-3}	75 µg m^{-3}
Maximum daily mean	19 µg m^{-3}	68 µg m^{-3}
Average	3 µg m^{-3}	21 µg m^{-3}
Data capture	97.9 %	98.3 %

+ PM_{10} as measured by a TEOM using a factor of 1.3 to give Indicative Gravimetric Equivalent concentrations
All mass units are at 20'C and 1013mb

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
Sulphur Dioxide	15-minute mean > 266 µg m^{-3}	0	0
Sulphur Dioxide	Hourly mean > 350 µg m^{-3}	0	0
Sulphur Dioxide	Daily mean > 125 µg m^{-3}	0	0
PM_{10} Particulate Matter (Gravimetric)	Daily mean > 50 µg m^{-3}	6	6
PM_{10} Particulate Matter (Gravimetric)	Annual mean > 40 µg m^{-3}	0	-

Produced by AEA Energy & Environment on behalf of Derry CC

Derry Brandywell Air Monitoring
Hourly Mean Data for 01 January to 31 December 2007



For further information on air pollution monitoring please don't hesitate to contact:
David Madle
Environmental Quality
AEA Energy & Environment
Building 551.11
Harwell
Didcot
Oxfordshire
OX11 0QJ

Direct line 0870 190 6523
Direct facsimile 0870 190 6377
e-mail David.Madle@aeat.co.uk

Appendix 2.2:

DALE'S CORNER AIR MONITORING STATION

Pollutant Concentrations (NO_2) at Dale's Corner Air Quality Monitoring Station, 2005

Produced by AEA Energy & Environment on behalf of Derry CC

DERRY DALE'S CORNER
01 January to 31 December 2005

These data have been fully ratified by AEA Energy & Environment

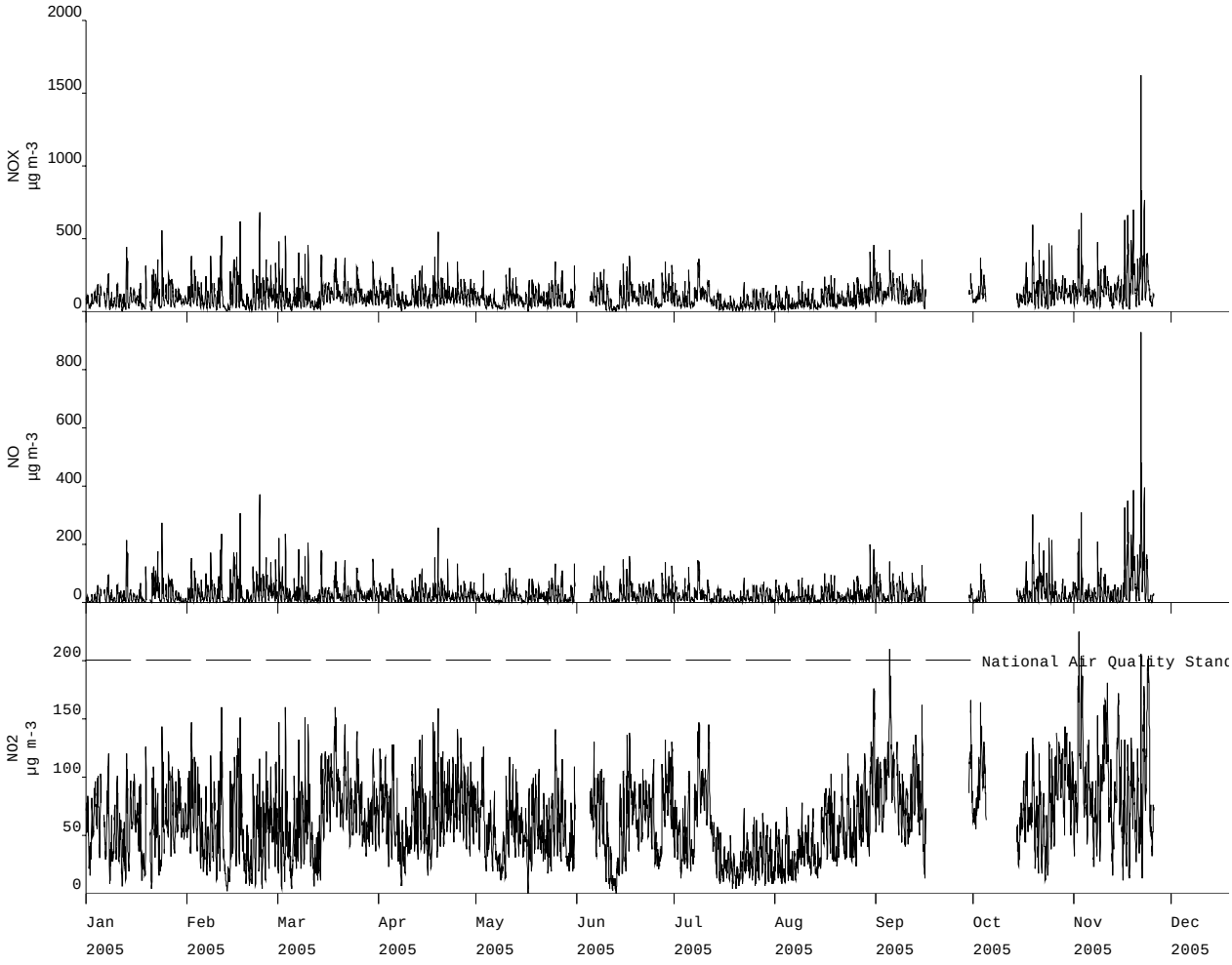
POLLUTANT	NO_X	NO	NO_2
Number Very High	-	-	0
Number High	-	-	0
Number Moderate	-	-	0
Number Low	-	-	7130
Maximum 15-minute mean	2156 µg m^{-3}	1239 µg m^{-3}	288 µg m^{-3}
Maximum hourly mean	1625 µg m^{-3}	929 µg m^{-3}	225 µg m^{-3}
Maximum running 8-hour mean	830 µg m^{-3}	479 µg m^{-3}	195 µg m^{-3}
Maximum running 24-hour mean	453 µg m^{-3}	243 µg m^{-3}	167 µg m^{-3}
Maximum daily mean	415 µg m^{-3}	228 µg m^{-3}	147 µg m^{-3}
Average	105 µg m^{-3}	28 µg m^{-3}	62 µg m^{-3}
Data capture	81.4 %	81.4 %	81.4 %

All mass units are at 20'C and 1013mb
NO_X mass units are NO_X as NO_2 µg m-3

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	1	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	8	6

Produced by AEA Energy & Environment on behalf of Derry CC

Derry Dale's Corner Air Monitoring
Hourly Mean Data for 01 January to 31 December 2005



For further information on air pollution monitoring please don't hesitate to contact:

David Madle
Environmental Quality
AEA Energy & Environment
Building 551.11
Harwell
Didcot
Oxfordshire
OX11 0QJ

Direct line 0870 190 6523
Direct facsimile 0870 190 6377
e-mail David.Madle@aeat.co.uk

Pollutant Concentrations (NO_2) at Dale's Corner Air Quality Monitoring Station, 2006

Produced by AEA Energy & Environment on behalf of Derry CC

DERRY DALE'S CORNER
01 January to 31 December 2006

These data have been fully ratified by AEA Energy & Environment

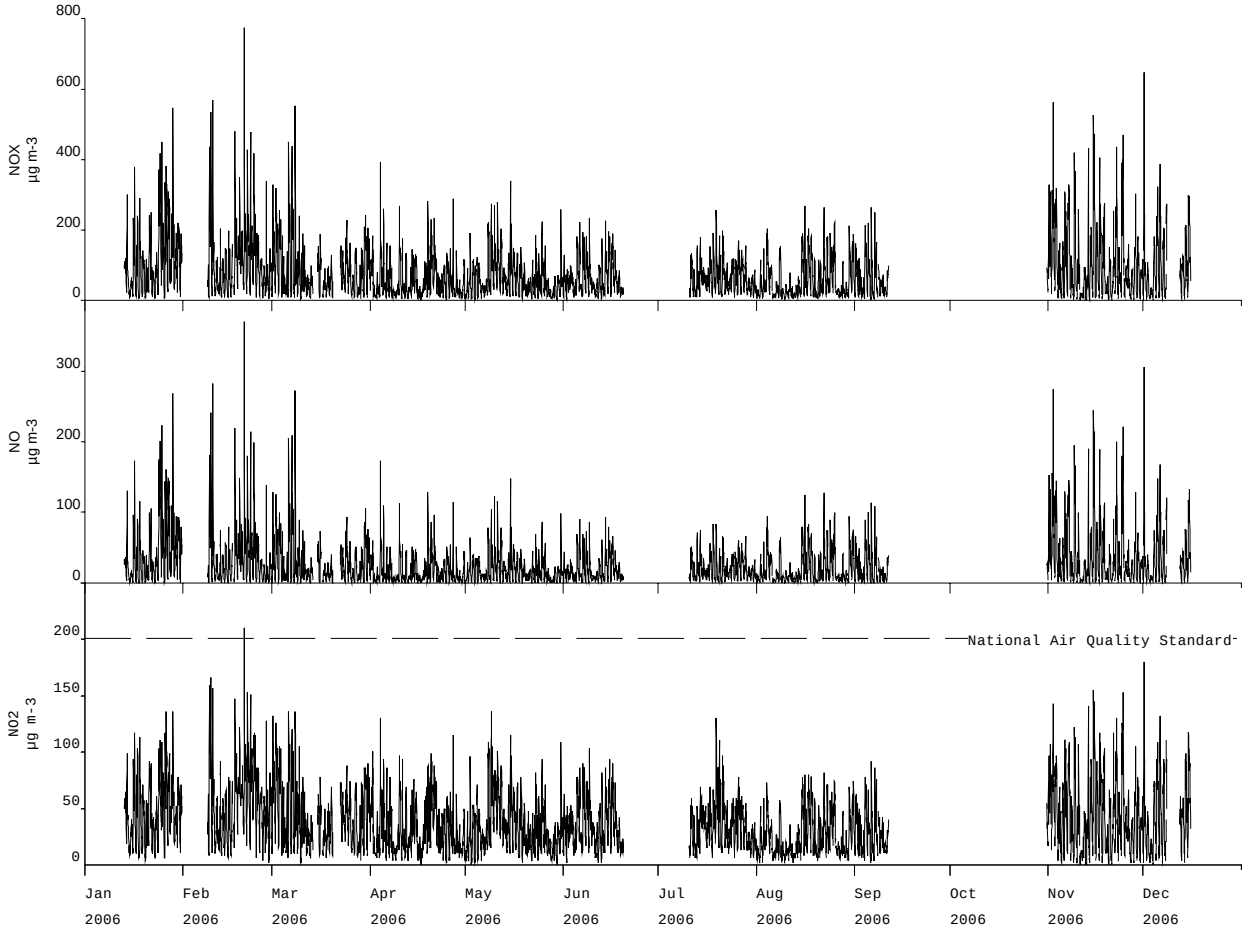
POLLUTANT	NO_X	NO	NO_2
Number Very High	-	-	0
Number High	-	-	0
Number Moderate	-	-	0
Number Low	-	-	5883
Maximum 15-minute mean	860 µg m^{-3}	405 µg m^{-3}	254 µg m^{-3}
Maximum hourly mean	775 µg m^{-3}	370 µg m^{-3}	210 µg m^{-3}
Maximum running 8-hour mean	423 µg m^{-3}	193 µg m^{-3}	129 µg m^{-3}
Maximum running 24-hour mean	243 µg m^{-3}	107 µg m^{-3}	87 µg m^{-3}
Maximum daily mean	239 µg m^{-3}	104 µg m^{-3}	84 µg m^{-3}
Average	76 µg m^{-3}	26 µg m^{-3}	37 µg m^{-3}
Data capture	67.2 %	67.2 %	67.2 %

All mass units are at 20'C and 1013mb
NO_X mass units are NO_X as NO_2

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	0	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	1	1

Produced by AEA Energy & Environment on behalf of Derry CC

Derry Dale's Corner Air Monitoring
Hourly Mean Data for 01 January to 31 December 2006



For further information on air pollution monitoring please don't hesitate to contact:

David Madle
Environmental Quality
AEA Energy & Environment
Building 551.11
Harwell
Didcot
Oxfordshire
OX11 0QJ

Direct line 0870 190 6523
Direct facsimile 0870 190 6377
e-mail David.Madle@aeat.co.uk

Pollutant Concentrations (NO_2) at Dale's Corner Air Quality Monitoring Station, 2007

Produced by AEA Energy & Environment on behalf of Derry CC

DERRY DALE'S CORNER
01 January to 31 December 2007

These data have been fully ratified by AEA Energy & Environment

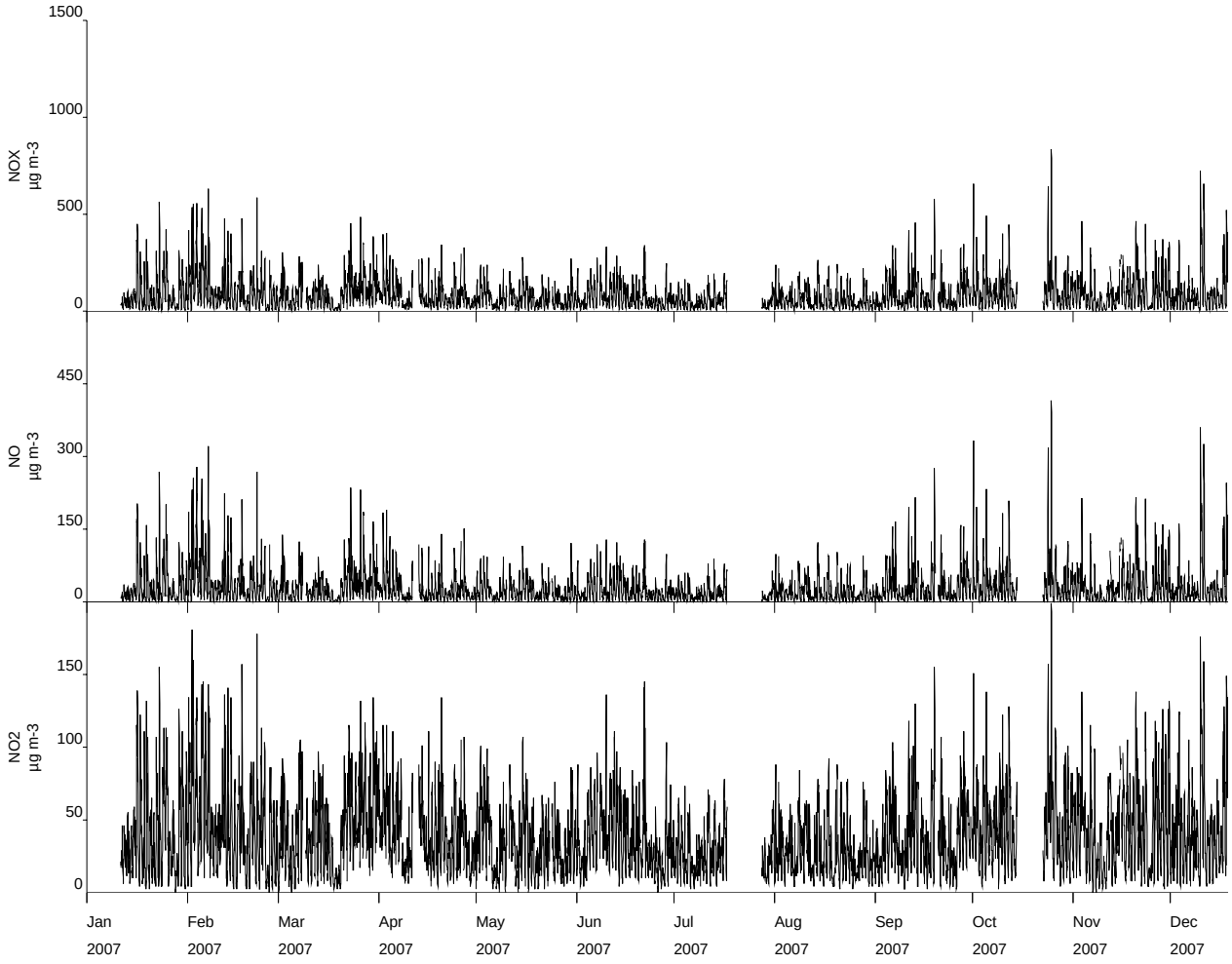
POLLUTANT	NO_X	NO	NO_2
Number Very High	-	-	0
Number High	-	-	0
Number Moderate	-	-	0
Number Low	-	-	7769
Maximum 15-minute mean	1159 µg m^{-3}	610 µg m^{-3}	277 µg m^{-3}
Maximum hourly mean	1008 µg m^{-3}	534 µg m^{-3}	199 µg m^{-3}
Maximum running 8-hour mean	644 µg m^{-3}	326 µg m^{-3}	150 µg m^{-3}
Maximum running 24-hour mean	387 µg m^{-3}	184 µg m^{-3}	114 µg m^{-3}
Maximum daily mean	375 µg m^{-3}	178 µg m^{-3}	107 µg m^{-3}
Average	83 µg m^{-3}	29 µg m^{-3}	39 µg m^{-3}
Data capture	88.7 %	88.7 %	88.7 %

All mass units are at 20'C and 1013mb
NO_X mass units are NO_X as NO_2 µg m-3

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	0	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	0	0

Produced by AEA Energy & Environment on behalf of Derry CC

Derry Dale's Corner Air Monitoring
Hourly Mean Data for 01 January to 31 December 2007



For further information on air pollution monitoring please don't hesitate to contact:
David Madle
Environmental Quality
AEA Energy & Environment
Building 551.11
Harwell
Didcot
Oxfordshire
OX11 0QJ

Direct line 0870 190 6523
Direct facsimile 0870 190 6377
e-mail David.Madle@aeat.co.uk

Appendix 2.3:

CULMORE POINT ROAD PM_{10} AIR MONITORING STATION

Produced by AEA Energy & Environment on behalf of Derry CC

DERRY CULMORE POINT
12 December 2007 to 22 July 2008

These data are provisional from 01/03/2008 and may be subject to further quality control

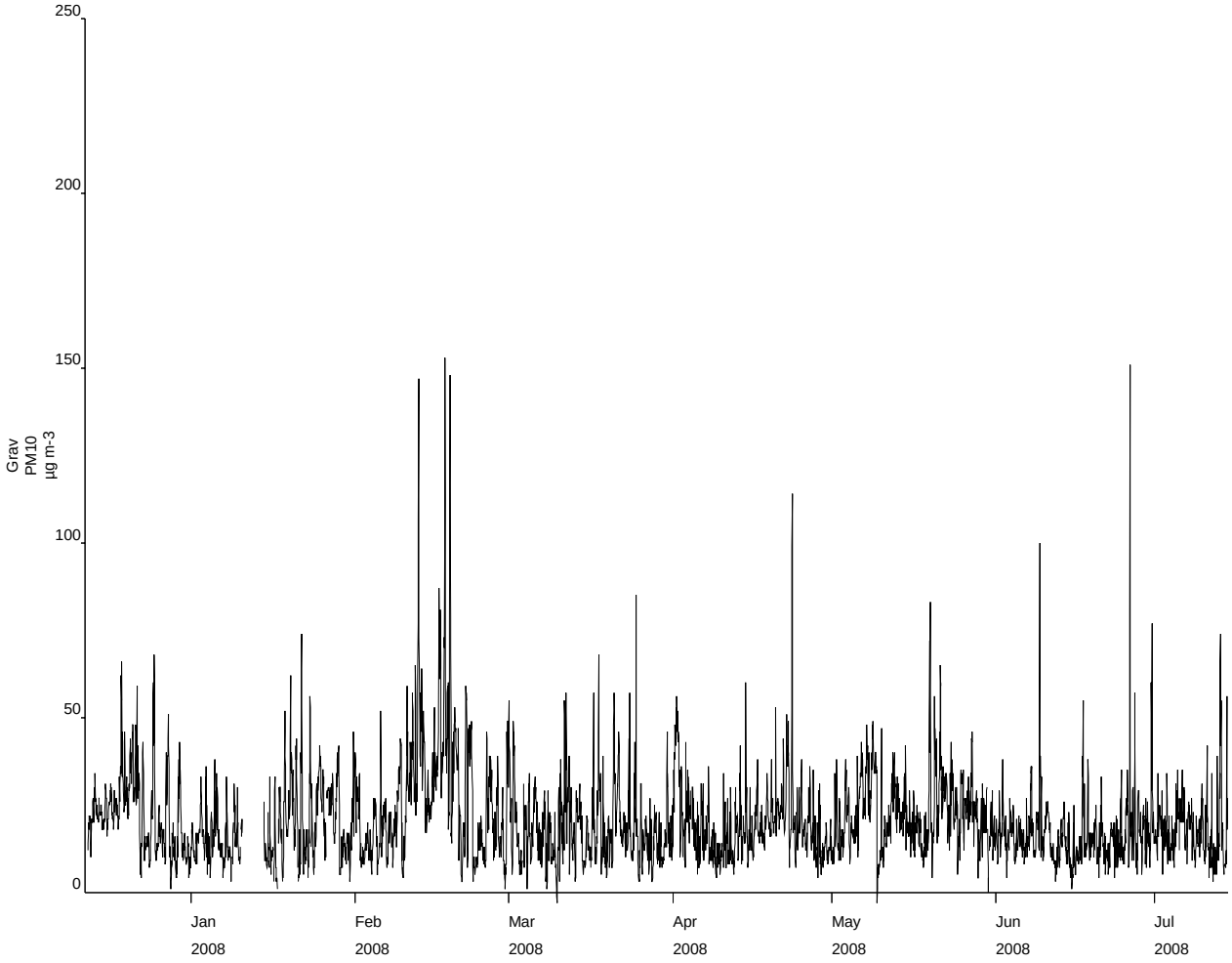
POLLUTANT	PM_{10}*+
Number Very High	0
Number High	0
Number Moderate	0
Number Low	5237
Maximum 15-minute mean	329 µg m^{-3}
Maximum hourly mean	241 µg m^{-3}
Maximum running 8-hour mean	140 µg m^{-3}
Maximum running 24-hour mean	62 µg m^{-3}
Maximum daily mean	59 µg m^{-3}
Average	20 µg m^{-3}
Data capture	97.0 %

* PM_{10} Indicative Gravimetric Equivalent
+ PM_{10} as measured by a TEOM using a factor of 1.3 to give indicative gravimetric equivalent
All mass units are at 20'C and 1013mb

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
PM_{10} Particulate Matter (Gravimetric)	Daily mean > 50 µg m^{-3}	3	3
PM_{10} Particulate Matter (Gravimetric)	Annual mean > 40 µg m^{-3}	-	-

Produced by AEA Energy & Environment on behalf of Derry CC

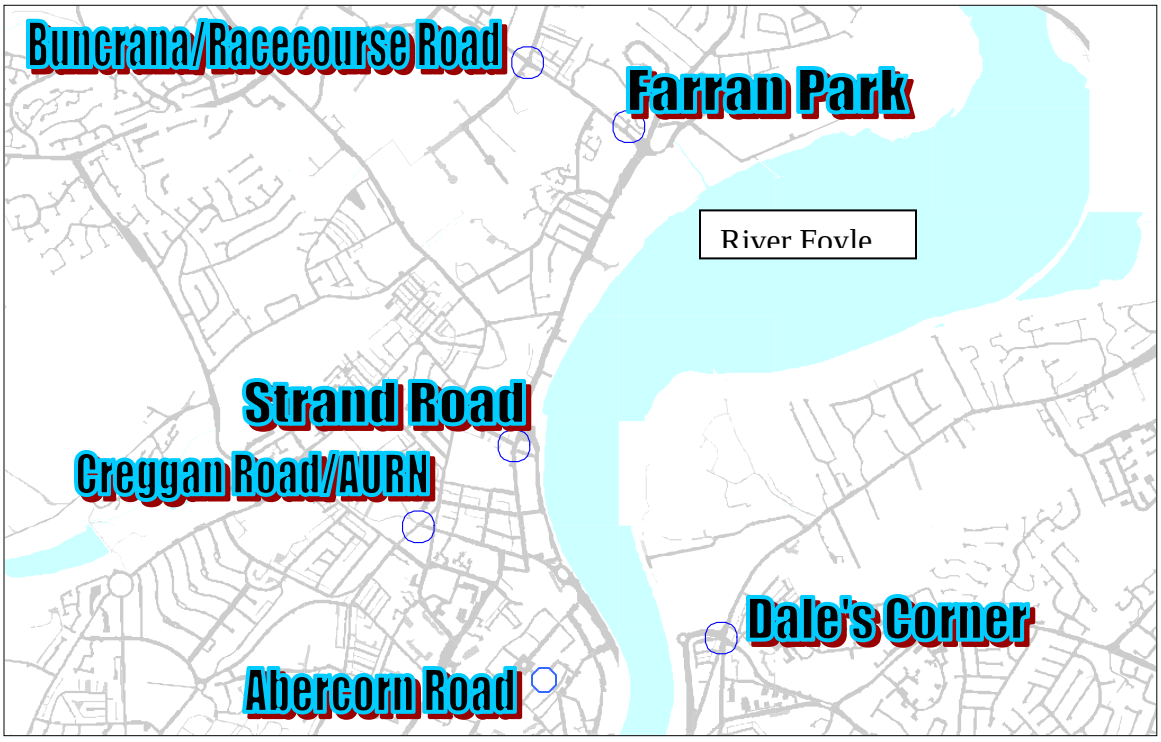
Derry Culmore Point Air Monitoring
Hourly Mean Data for 12 December 2007 to 22 July 2008



For further information on air pollution monitoring please don't hesitate to contact:
David Madle
Environmental Quality
AEA Energy & Environment
Building 551.11
Harwell
Didcot
Oxfordshire
OX11 0QJ

Direct line 0870 190 6523
Direct facsimile 0870 190 6377
e-mail David.Madle@aeat.co.uk

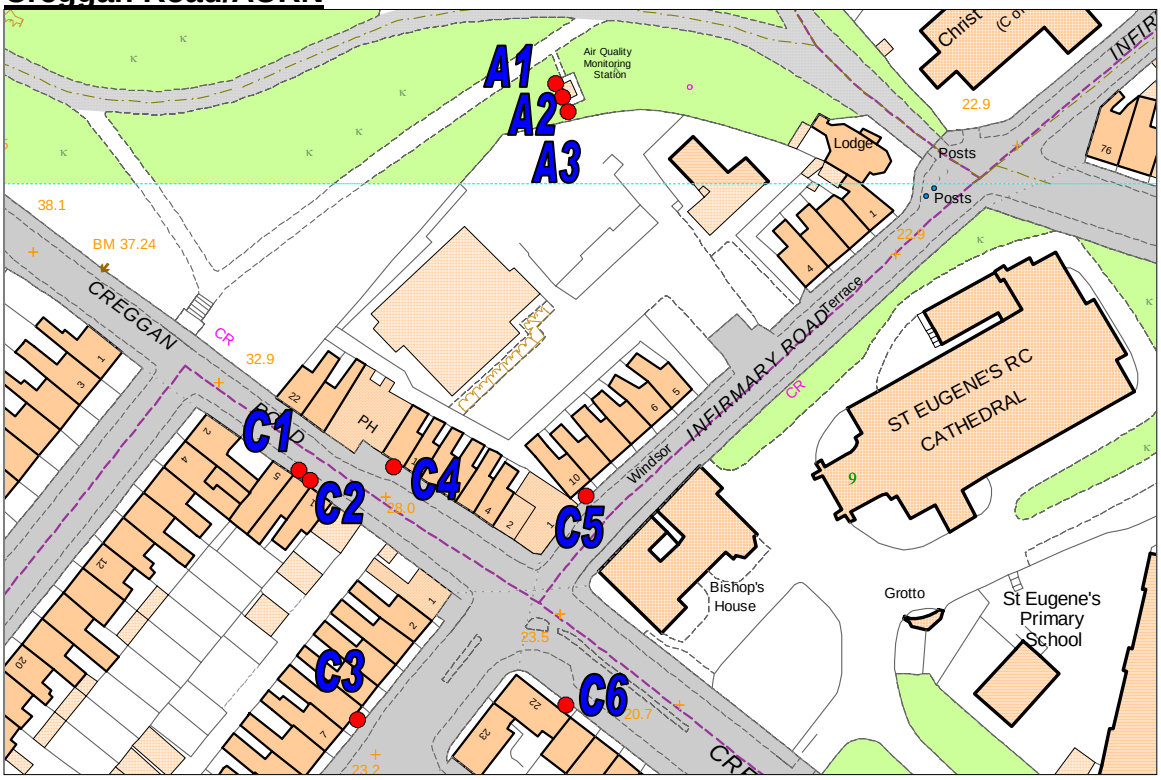
Appendix 3: NO_2 Diffusion Tube locations



Overview of NO2 Diffusion Tube Monitoring sites in Derry City Council District

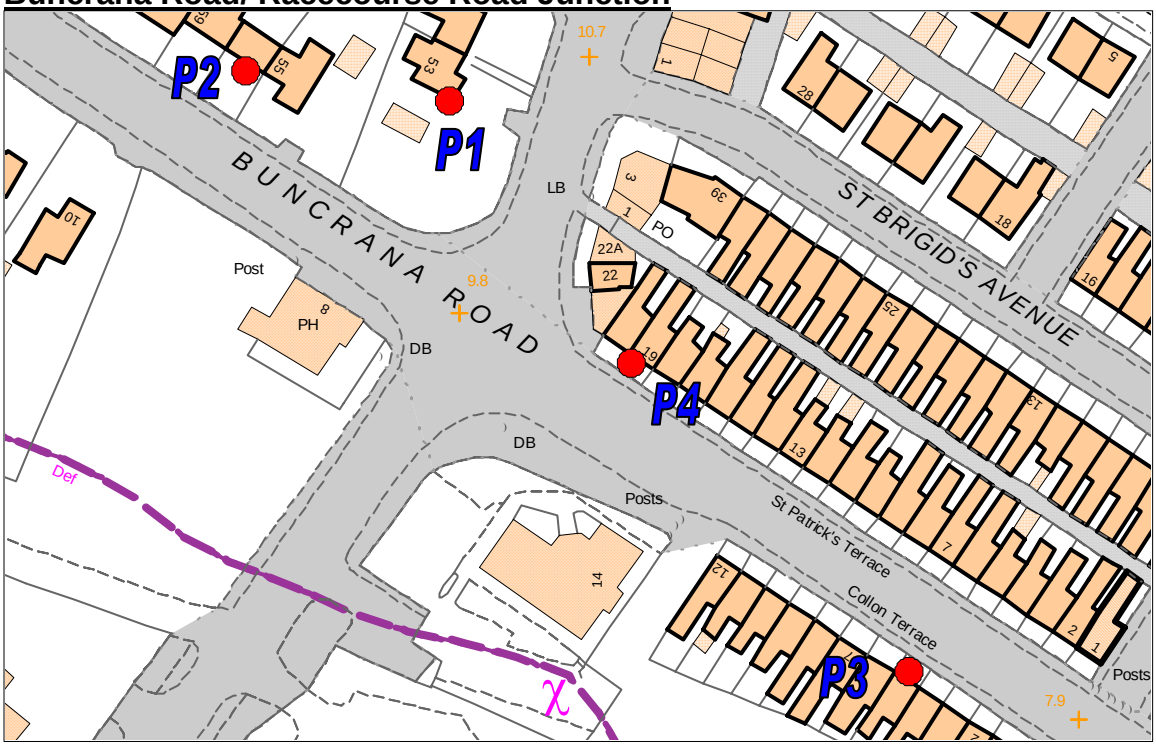
(See following pages for detailed maps of the above junctions and locations of each NO_2 tube)

Creggan Road/AURN



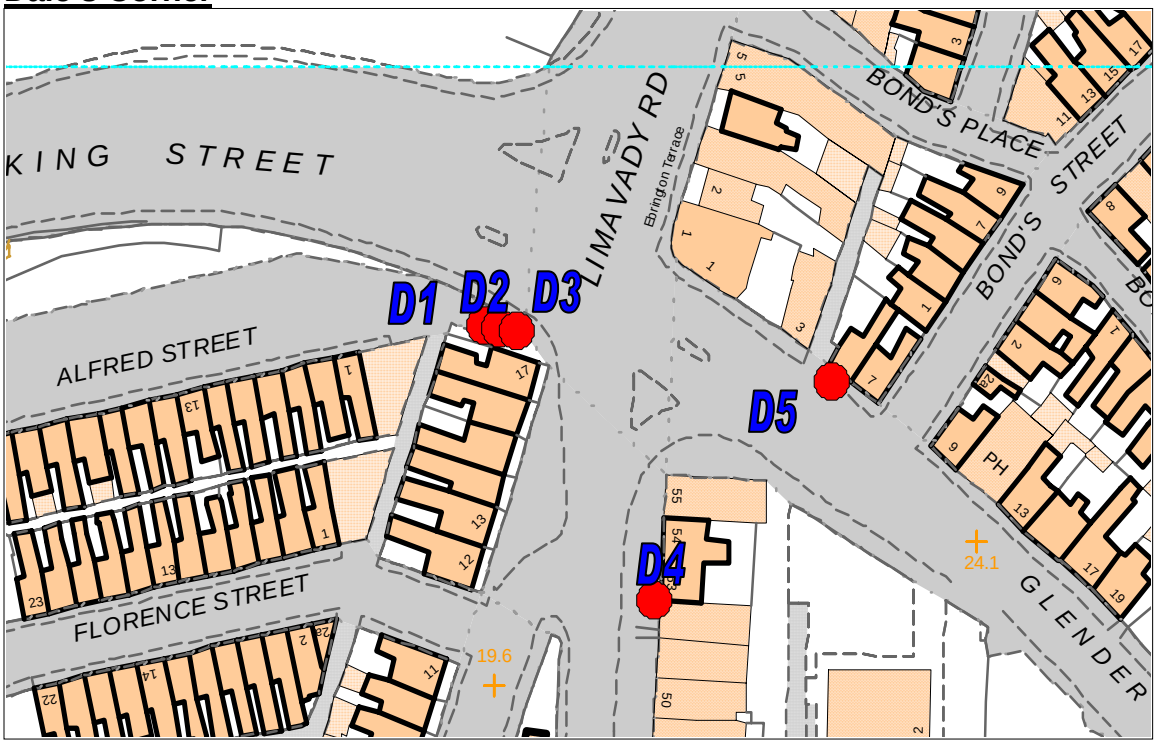
"© Crown Copyright OSNI Licence LA 41"

Buncrana Road/ Racecourse Road Junction



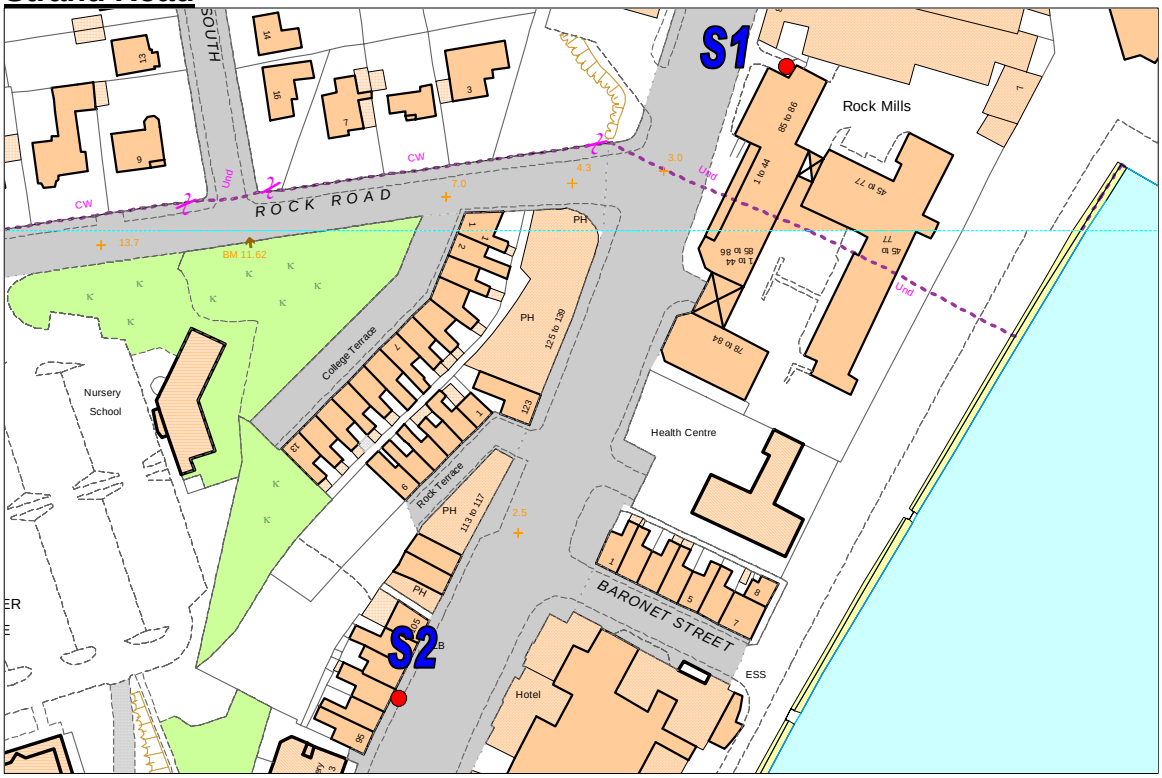
"© Crown Copyright OSNI Licence LA 41"

Dale's Corner



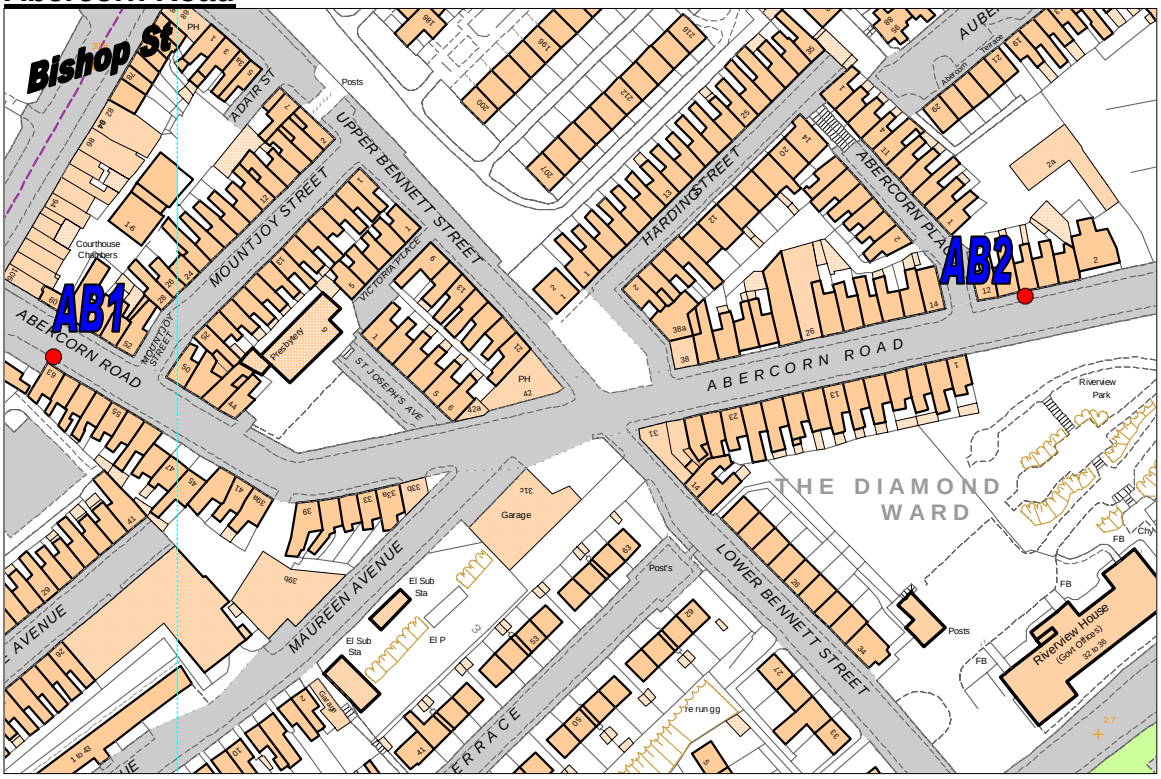
"© Crown Copyright OSNI Licence LA 41"

Strand Road



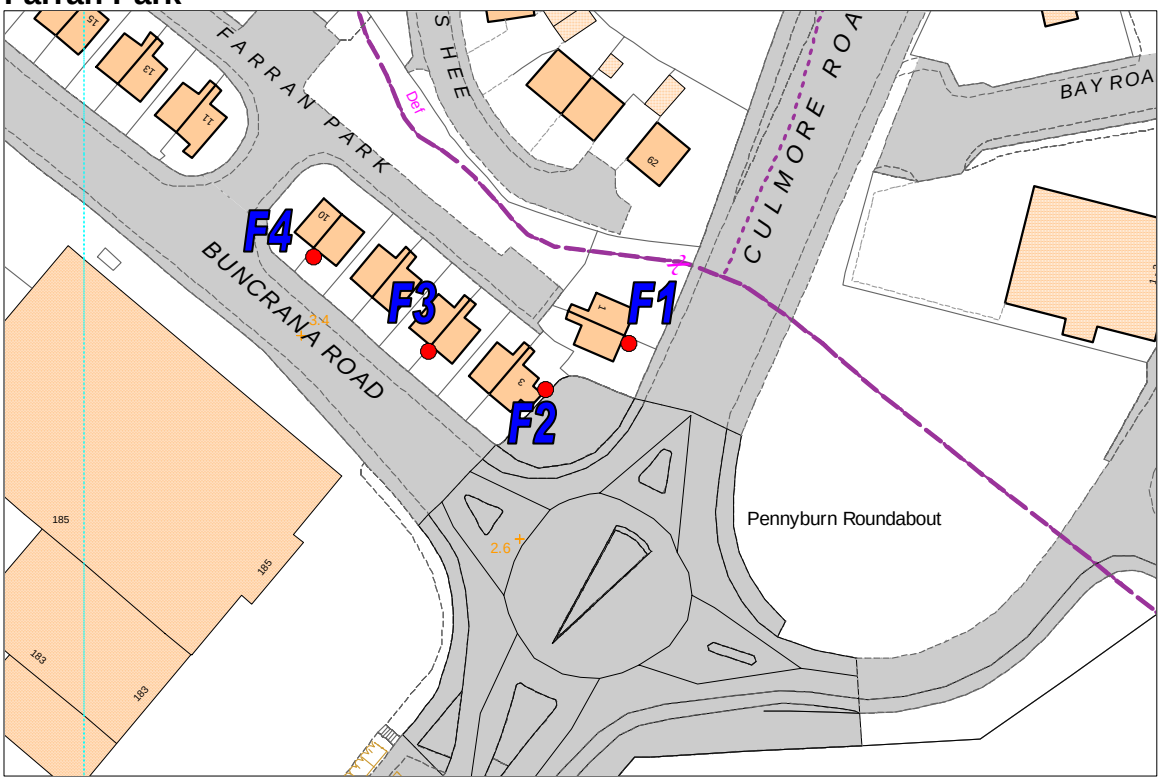
"© Crown Copyright OSNI Licence LA 41"

Abercorn Road



"© Crown Copyright OSNI Licence LA 41"

Farran Park



"© Crown Copyright OSNI Licence LA 41"

Appendix 4.1: Table 4.1: NO_2 Diffusion Tube Results for period Jan. - Dec. 2006

Nitrogen Dioxide Diffusion Tube Results 2006 (Concentration ug/m3)

No.	Site Ref	Property Address	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
		CREGGAN RD												
1	C1	3 Creggan Rd	56	50	40	54	21	55	48	16		52	72	68
2	C2	3 Creggan Rd	39	24	40	56	34	49	41	27		55	5	70
3	C3	6 Marlborough Terrace	16	25	28	26	27	25	24	15		30	37	33
4	C4	22A Creggan Street	39	37	29	36	31	34	28	16		43	43	34
5	C5	10 Windsor Terrace	14	26	22	29	17	21	19	10		32	32	25
6	C6	14 Creggan Road	25	38	28	26	14	23	25	12		43	35	29
		DALES CORNER												
7	D1	Monitor	26	24	29	28	19	21	28	9		30	45	33
8	D2	Monitor	31	16	21	24	23	26	21	9		36	37	33
9	D3	Monitor	32	32	17	24	10	20	27	8		33	53	40
10	D4	52 Clooney Terrace	32	18	11	16	15	11	18	8		30	27	24
11	D5	5 Glendermott Road	30	44	38	41	32	31	32	20		41	31	44
		FARRAN PARK												
12	F1	2 Farran Park	24	24	21	12	15	19	14	10		32	28	32
13	F2	3 Farran Park	33	27	20	21	17	17	17	10		26	33	31
14	F3	5 Farran Park	27	25	21	22	17	11	22	9		22	20	25
15	F4	9 Farran Park	15	20	14	17	15	15	18	7		20	24	
		PENNYBURN												
16	P1	53 Messines Park	8	9	17	10	11	13	18	7		21	18	25
17	P2	57 Messines Park	18	18	30	13	19	25	29	11		25	24	28
18	P3	19 St Patrick's Terrace	32	34	26	26	26	24	22	12		31	27	26
19	P4	5 Collon Terrace	17	15	29	40	29	28	35	14		39	49	49
		STRAND RD												
20	S1	99 Strand Road	32	25	32	25	35	31		14		41	36	37
21	S2	Rockmills	39	31	25	9	25	22	27	6		32	21	48
		AUN												
22	A1	Brooke Park	23	19	18	9	9	5	5	6		16	19	23
23	A2	Brooke Park	22	25	11	8	10	5	5	4		14	19	19
24	A3	Brooke Park	18	10	15	11	12	5	5	3		16	20	18

NB Lambeth Scientific used Jan - Aug 2006. Bureau Veritas used Oct - Dec 2006

Appendix 4.2: Table 4. 2: NO_2 Diffusion Tube Results for period Jan.- Dec. 2007

Nitrogen Dioxide Diffusion Tube Results 2007 (Concentration ug/m3)

No.	Site Ref	Address	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Average	Corrected Average
		AURN														
1	A1	AURN	18	21	14	14	16	8	8	19	13	25	19	22	16	15
2	A2	AURN	23	20	18	19	12	6	7	13	12	25	23	24	17	15
3	A3	AURN	19	24	19	13	9	8	11	11	16	26	21	21	17	15
		CREGGAN ROAD JUNCTION														
4	C1	3 Creggan Rd	70	60	62	83	62	40	65	68	63	88	112	66	70	**64**
5	C2	3 Creggan Rd	57	57	80	54	54	32	47	61	69	76	97	66	63	**58**
6	C3	6 Marlborough Terrace	39	32	30	42	31	23	24	24	37	40	57	41	35	32
7	C4	22A Creggan Street	50	39	45	1	95	33	40	32	36	52	54	42	43	39
8	C5	10 Windsor Terrace	36	34	24	34	28	14	26	28	37	43	2	31	28	25
9	C6	14 Creggan Road	36	38	33	51	43	43	45	52	45	39	43		43	**40**
		DALES CORNER														
10	D1	Monitor	42	36	36		42	32	30	27	32	43	54	42	38	34
11	D2	Monitor	39	33	28	37	33	27	30	22	22	41	56	33	33	30
12	D3	Monitor	35	36	36	32	29	22	32	26	33	41	41	39	34	31
13	D4	52 Clooney Terrace	27	30	27	30	18	18	17	18	31	36	35	54	28	26
14	D5	5 Glendermott Road	50	45	52	53	43	42	55	61	49	61	83	1	50	**45**
		FARRAN PARK														
15	F1	2 Farran Park	23	28	30	24	20	17	17	4	26	41	30	37	25	23
16	F2	3 Farran Park	34	32		36	22	16	19	23	18	44	39	33	29	26
17	F3	5 Farran Park	31	31	32	34	22	16	19	24	37	42	41	42	31	28
18	F4	9 Farran Park	29	30	23	11	20	9	14	12	25	36	33	34	23	21
		PENNYBURN														
19	P1	53 Messines Park	23	28	24	28	14	11	12	15	21	32	40	30	23	21
20	P2	57 Messines Park	31	38	26	37	22	28	20	16	31	41	36	36	30	28
21	P3	19 St Patrick's Terrace	38	45	32	53	1	38	35	31	37	38	49	39	36	33
22	P4	5 Collon Terrace	42	48	49	46	41	20	26	39	37	53	61	49	43	39
		STRAND RD														
23	S1	99 Strand Road	56	40	41	34			25	48	33	47	71	47	44	39
24	S2	Rockmills	36	47	27	36	26	24	24	25	30	47	43		33	30
		ABERCORN ROAD														
25	AB1	63 Abercorn Road						32	1			58	48	49	38	34
26	AB2	8 Abercorn Road						21	37	29	27	30	45	25	31	28

Appendix 4.3: Table 4.3: NO_2 Diffusion Tube Results for period Jan – Dec. 2008

Nitrogen Dioxide Diffusion Tube Results 2008 (Concentration ug/m3)

No.	Site Ref	Address	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Average	Corrected Average
		AURN														
1	A1	AURN	23	27	17	16	13	12	10	11					16	14
2	A2	AURN	26	25	21	15	17	11	11	11					17	15
3	A3	AURN	22	26	17	15	17	10	10	9					16	14
		CREGGAN ROAD JUNCTION														
4	C1	3 Creggan Rd	73	97	85	67	62	71	27	60					68	**62**
5	C2	3 Creggan Rd	70	82	81	66	60	72	54	64					69	**63**
6	C3	6 Marlborough Terrace	40	42	51	36	1	1	1	55					28	25
7	C4	22A Creggan Street	51	59	52	44	40	37	46	37					46	**41**
8	C5	10 Windsor Terrace*		39		34	30	32		48					37	34
9	C6	14 Creggan Road	36	48	49	55	46	38	31	33					42	39
		DALES CORNER														
10	D1	Monitor	43	47	42	40	32	35	27	29					37	33
11	D2	Monitor	46	47	41	40	42	28	26	30					38	33
12	D3	Monitor	43	43	42	36	40	34	35	31					38	34
13	D4	52 Clooney Terrace	30	1	55	29	40	23	20	21					27	25
14	D5	5 Glendermott Road	85	61	62	62	58	45	52	58					60	**53**
		FARRAN PARK/EBRINGTON TERRACE														
15	F1	4 Ebrington Terrace**	56	54	55	67	63	34	52	46					53	**49**
16	F2	3 Farran Park	42	44	32	27	31	25	21	24					31	27
17	F3	4 Ebrington Terrace**	58	59	51	55	81	50	50	53					57	**52**
18	F4	4 Ebrington Terrace**	58	63	56	52	63	50	45	44					54	**49**
		PENNYBURN														
19	P1	53 Messines Park	32	32	26	26	27	18	17	18					25	22
20	P2	57 Messines Park		37	33	30	43	26	24	23					31	28
21	P3	19 St Patrick's Terrace	105	41	40	48	77	29	35						54	**42**
22	P4	5 Collon Terrace	55	61	59	45	37	44	34	40					47	**42**
		STRAND RD														
23	S1	99 Strand Road	41	44	51		36	35	28	36					39	35
24	S2	Rockmills	51	48	50	42	29	40	28						41	36
		ABERCORN ROAD														
25	AB1	63 Abercorn Road	35	49	42	43	43								42	40
26	AB2	8 Abercorn Road	45	40	42	41	39	33	29	26					37	33

* Changed to no.1 Windsor Terrace from August 2008 ** Monitoring commenced at this site in January 2008

Appendix 5: Table 5.1: Details of New Developments in Derry City Council Area

Development	Source of information	Details of development/ proposed development
New Part A processes	**E**nvironment and **H**eritage **S**ervice, **I**ndustrial **P**ollution and **R**adiochemical **I**nspectorate or LRMU	• Foyle Meats Ltd • Coolkeeragh ESB • Invista Textiles UK LTD • Du Pont Landfill
New Part B processes	As above	• LCC Oil Storage and Distribution terminal
New Part C processes	Local Authority EH Department	• Eginton Timber • Perfectseal Ltd • Flemmings Engineering • Foyle Dry Cleaners, Prestige Dry Cleaners and Smooth Operators Dry Cleaners • Brown and Mason mobile crushing plant
New road schemes	**D**epartment of **R**egional **D**evelopment Roads Service (NI)	• Skeoge Link Road • A2 Buncrana Road Improvements (Proposed) • A2 BroadBridge Maydown to City of Derry Airport Dualling (Proposed) • A5 Western Transport Corridor(WTC) • A6 Londonderry to Dungiven Dualling Scheme(Proposed)
New mixed use developments (residential/commercial)	Department of the Environment (NI) The Planning Service	• Crescent Link (Residential, Retail and Leisure Development) (Existing) • Major Housing Development at Ballynagalliagh (Proposed) • Fort George Masterplan • Ebrington Masterplan