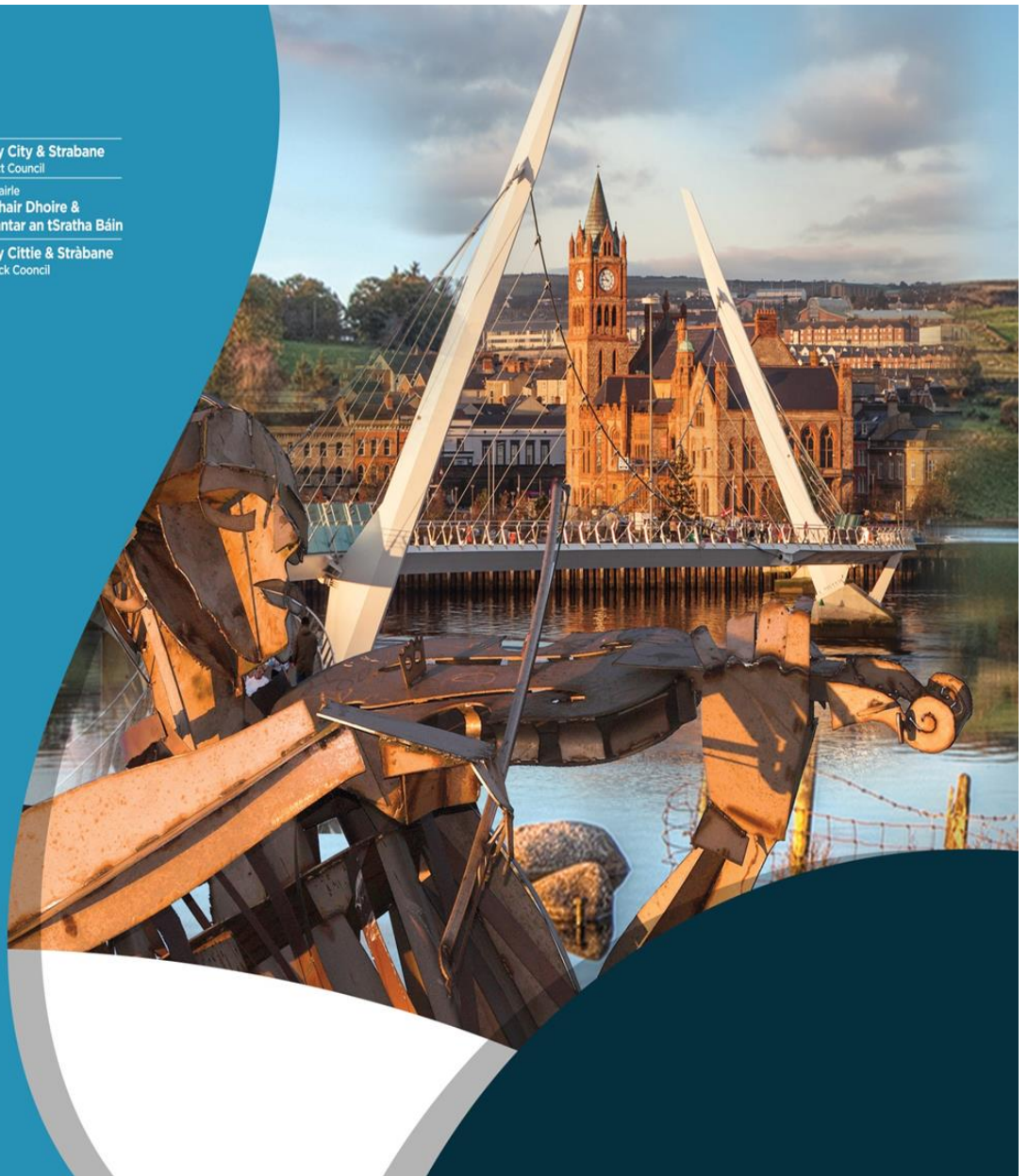




Derry City & Strabane
District Council
Comhairle
Chathair Dhoire &
Cheantar an tSratha Báin
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Derry City and Strabane District Council

2019 Air Quality Progress Report

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

Derry City and Strabane District Council

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Executive Summary

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. Results from monitoring by the Council are presented and sources of air pollution are identified.

This report confirms that air quality within Derry City and Strabane District Council area continues to meet the relevant air quality objectives at locations of relevant exposure, with the exception of locations within existing Air Quality Management Areas (AQMAs). There were no exceedances of any objectives outside the existing AQMA boundaries.

It is recommended that the Spencer Road AQMA should be revoked due to reduced pollutant concentrations, well below the limit value, over the last number of years. The remaining AQMAs are considered appropriate and should remain unchanged. There is no requirement to proceed to a Detailed Assessment for any pollutant.

The report has not identified any significant changes in emissions sources within Derry City and Strabane District Council area. There have been no new relevant industrial installations and no new significant commercial, domestic or fugitive sources of emissions.

An update has also been provided on the measures contained in Council's Air Quality Action Plan. It is proposed to amend the Action Plan to take account of additional measures that Council has undertaken and also other proposed measures.

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Appendix B: Air Quality Report- Dale's Corner

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Appendix D: Air Quality reports – Strathfoyle, Derry

Appendix E: Annualisation of 14 Creggan Road Diffusion Tube Data.

Appendix F: Calculations of Precision and Accuracy of Triplicate Tubes- Dale's Corner

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Appendix J: Rosemount Diffusion Tube Collocation Data Questionnaire

1 Introduction

1.1 Description of Local Authority Area

Derry City and Strabane District Council is located in the west of Northern Ireland. Derry City is the second-largest city in Northern Ireland, situated on the River Foyle, and includes Foyle Port and the City of Derry Airport within its boundaries. Road transport emissions have previously been found to be the dominant source of air pollution in the Derry City area. The remainder of the district is largely rural in character, the largest population centre outside Derry being Strabane Town.

1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) 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 exceedances 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.

For Local Authorities in Northern Ireland, 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 LAQM 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 exceedance 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 $\mu\text{g}/\text{m}^3$ (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 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	3.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010
1,3-butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.50 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
Particulate matter (PM ₁₀) (gravimetric)	50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

As part of the review and assessment process, Derry City and Strabane District Council has prepared a number of air quality reports. A summary is provided in Table 1.2. In 2005 an AQMA was declared at the Creggan Road / Infirmary Road junction in Derry City, in 2011 two additional AQMAs were declared at Dale's Corner and at the Buncrana Road / Racecourse Road junction. In 2012/2013 two further AQMAs were declared at Spencer Road and Strand Road, all for exceedances of the annual mean NO₂ objective.

In October 2018 the Strand Road AQMA was revoked and the Spencer Road AQMA was reduced in size.

The remaining AQMAs are shown in Figures 1.1 to 1.4

Three AQMAs were declared in Strabane, Newtownstewart and Castlederg in 2004 for exceedances of the annual and 24-hour mean PM₁₀ objectives due to domestic heating. These 3 AQMA's were revoked in October 2018. An Action Plan was developed in order to identify measures to reduce ambient concentrations of particles and to attempt to comply with the objectives for PM₁₀.

The Council has also completed updating and screening assessments that did not highlight any other areas of concern that required a detailed assessment to be undertaken.

Table 1.2 summarises the Review and Assessment work carried out by the former Derry City Council up to and including 2014. After the new DCSDC was formed in April 2015, a single report was produced – “the 2015 Updating and Screening Assessment, 2016 Progress Report and 2017 Progress Report” and showed all the required LAQM report data including updated monitoring.

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Table 1.2 Summary of Review and Assessment by Derry City Council

Report	Summary
2004 Detailed Air Quality Modelling of Domestic Fuel Use and Road Traffic Emissions in Derry (Stage 3)	Exceedances of the annual mean NO ₂ concentrations were modelled at the Creggan Road / Infirmary Road junction, and the Council subsequently declared an AQMA in February 2005, and a draft Air Quality Action Plan was released in November 2006. The 2004 Detailed Assessment concluded that PM ₁₀ exceedances were not expected; however, it was not possible to rule out potential exceedances of the SO ₂ or PM ₁₀ objectives due to the resolution of the modelling undertaken.
2005 Progress Report	The 2005 Progress Report provided a review of the most recent monitoring data within the local authority. Automatic monitoring of SO ₂ and PM ₁₀ at Brandywell indicated a large drop in the number of 15-minute and daily mean exceedances, reflecting the decreased use of solid fuel in the area.
2006 Updating & Screening Assessment	The Updating & Screening Assessment identified 2 locations to consider for the Detailed Assessment of NO ₂ : Dale's Corner and the Buncrana Road / Racecourse Road Junction. It was concluded that no further assessment was required for carbon monoxide, benzene, 1,3-butadiene, lead or sulphur dioxide, however, assessment was required for PM ₁₀ at a rural area near Claudy, and in the Culmore Point area.
2007 Detailed Assessment and Further Assessment	A Detailed Assessment was undertaken for Dale's Corner and Buncrana Road / Racecourse Road Junction following measured exceedance of the NO ₂ annual mean objective. It was determined that a declaration of an AQMA at either location was not required at the time, as the modelling did not confirm exceedances of the air quality objectives at locations of relevant exposure. A Further Assessment was undertaken for the existing AQMA at Creggan Road / Infirmary Road, and it was concluded that there was a continuing need for the AQMA, though no extension was considered necessary.
2008 Progress Report	Review of updated NO ₂ monitoring data for the Creggan Road / Infirmary Road junction confirmed the continuing need for the AQMA. Decreases were seen in concentrations of SO ₂ . The Progress Report proposed that a new detailed dispersion modelling be undertaken at the Dale's Corner junction due to exceedances of the NO ₂ annual mean objective recorded at a new monitoring diffusion tube site at no.5 Glendermott Road.
2008 Final Air Quality Action Plan	The final Air Quality Action Plan, released in September 2008, included detailed dispersion modelling to quantify the potential impact of a number of traffic measures, which may be implemented to reduce air pollution in the area of the Creggan Road / Infirmary Road junction. Proposals included the removal of HGVs on specific road links within the AQMA.

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2008 Dale's Corner Detailed Assessment	The assessment confirmed that exceedances of the NO ₂ annual mean AQS objective were likely at the façade of properties along Glendermott Road and Limavady Road close to the junction and it was recommended that an AQMA encompassing these properties be declared. The Council declared the Dale's Corner AQMA in 2010.
2009 Updating & Screening Assessment	The Updating & Screening Assessment reviewed and assessed new monitoring data and potential new sources of pollutants within the Council area. There were no new or significantly changed sources identified which may cause potential exceedances of the AQS objectives. However, the assessment highlighted that a new Detailed Assessment was required with regard to NO ₂ at Bunrana Road / Racecourse Road junction based on updated monitoring data.
2010 Air Quality Progress Report and Bunrana Road Detailed Assessment	Based on updated 2009 monitoring data, the air quality Progress Report 2010 confirmed exceedances of the NO ₂ annual mean objective at several monitoring sites within the Creggan Road / Infirmary Road and Dale's Corner AQMAs and at the junction of Bunrana Road and Racecourse Road. The Detailed Assessment of Bunrana Road confirmed that a third AQMA was required at the junction for NO ₂ . The Council declared an AQMA at the junction in 2010.
2010 Dale's Corner Further Assessment	The report confirmed the need for an AQMA at Dale's Corner and provided detailed information related to source apportionment, population exposure and required reduction of NO _x emissions to comply with the AQS objectives. The Further Assessment also considered the impact of several mitigation measures. Conclusions were that the combined effect of these measures would result in significant reductions in NO ₂ levels, and compliance with the annual mean objective.
2011 Bunrana Road Further Assessment	The report confirmed the need for an AQMA at Bunrana Road and provided detailed information related to source apportionment, showing that road traffic is the main contributor to overall NO ₂ levels, population exposure and required reduction of emissions to comply with the AQS objectives. The Further Assessment estimated that the annual mean objective would be met at all locations by 2014, however it was noted that this was an optimistic estimate, as predicted concentrations were likely to be underestimated as shown by recent NO ₂ monitoring trends across the UK.
2011 Progress Report	Review of updated monitoring data showed that areas within the existing AQMAs were still exceeding the NO ₂ objective. In addition, four new areas of where exceedances were identified in Spencer Road, John Street, Strand Road and Abercorn Road. A Detailed Assessment was therefore recommended.
2012 Air Quality Action Plan Update	The Air Quality Action Plan update reviewed the first AQAP to incorporate the new AQMAs. The AQAP included details of the traffic measures which may be implemented to reduce air pollution in the identified AQMAs together with an update as to how measures

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	identified in 2008 have been implemented.
2012 Updating & Screening Assessment	Review of updated monitoring data showed that areas within the existing AQMAs were still exceeding the NO ₂ objective. It was noted that concentrations in John Street, Strand Road and Abercorn Road had fallen below objective levels and it was recommended to continue monitoring in these locations. Concentrations at Spencer Road were still exceeding the objectives and a Detailed Assessment was recommended.
2012 Detailed Assessments	Based on monitoring results, the Council decided to undertake Detailed Assessments at Spencer Road, John Street, Strand Road and Abercorn Road. It was concluded, based on a combination of pollutant monitoring and predictive modelling, that AQMA's be declared at Spencer Road and Strand Road. The report found that there was no requirement to declare for John Street and Abercorn Road.
2012/2013 AQMA declaration	Based upon the outcome of the Detailed Assessments at Spencer Road and Strand Road, two new small AQMA areas were declared.
2013 Progress Report	Review of updated monitoring data showed that sites within the existing AQMAs were still exceeding the annual mean NO ₂ objective. It was therefore recommended to continue to monitor within the AQMAs and surrounding areas including Abercorn Road. The Council proceeded to the review of the Air Quality Action Plan to include the new AQMAs in Strand Road and Spencer Road.
2014 Detailed Assessment (Draft)	The modelling confirmed exceedances of the annual mean NO ₂ objective within all AQMAs, with the exception of the Strand Road AQMA. The area of exceedance in the Creggan Road and Bunrana Road AQMAs is smaller than when they were declared, therefore, amended AQMA boundaries were recommended.
2014 Progress Report	Review of updated monitoring data showed that sites within the existing AQMAs were still exceeding the annual mean NO ₂ objective, with the exception of the Strand Road AQMA. It was therefore concluded that the Council could consider potential revocation of the Strand Road AQMA. All other AQMAs are to remain in place.

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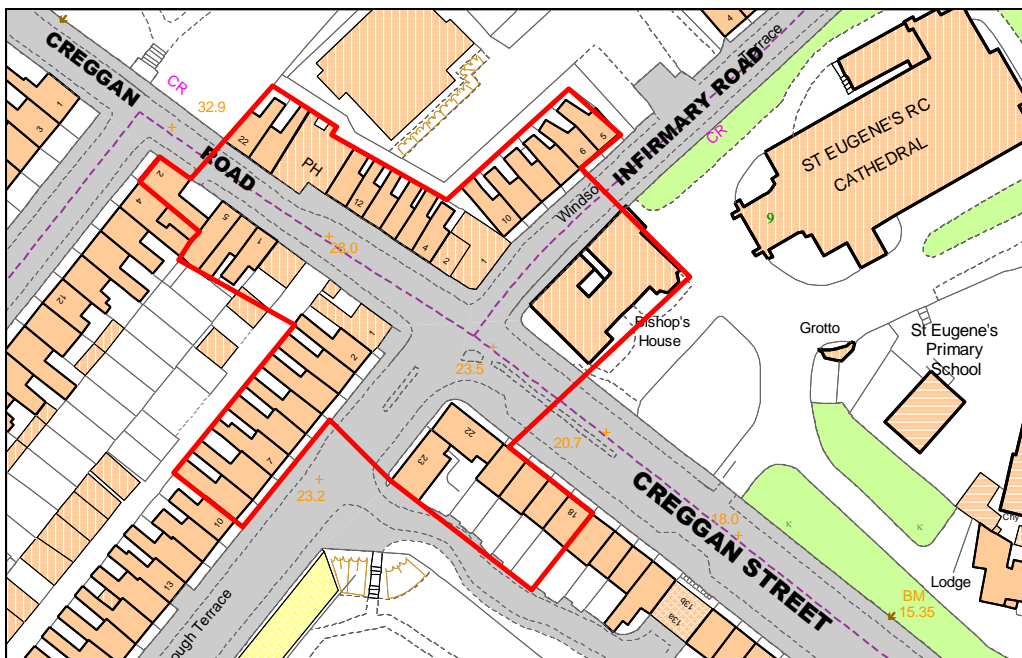
<p>2015 Updating and Screening Assessment, 2016 Progress Report and 2017 Progress Report</p>	<p>The report confirmed that air quality within the Council area continued to meet the relevant air quality objectives at locations of relevant exposure, with the exception of locations within existing Air Quality Management Areas (AQMAs). There were no objectives exceedances outside the existing AQMA boundaries, or within the Strand Road AQMA. It was recommended that the extent of the Spencer Road AQMA be reduced to reflect the 2014 Detailed Assessment and that the Strand Road AQMA be revoked. The remaining AQMAs were considered appropriate and should remain unchanged with no requirement to proceed to a Detailed Assessment. No significant changes in emissions sources within the Council area were identified with no new relevant industrial installations/ significant commercial, domestic or fugitive sources of emissions.</p>
<p>2015- 2017 Action Plan Progress Report</p>	<p>The Council is now in the process of revoking the AQMA's declared for Strabane, Newtownstewart and Castledearg in relation to exceedances of the air quality objectives for particulates (PM₁₀). The former SDC Action Plan measures have now been realised and pollution levels have reduced to well below health limit values. However, the Smoke Control Areas shall be maintained and enforced.</p> <p>The AQMA at Strand Road, declared due to nitrogen dioxide emissions, shall be revoked and the AQMA at Spencer Road shall be reduced in size to reflect updated monitoring and modelling results.</p> <p>The Council is currently revising the Air Quality Action Plan to reflect the new Council boundary. The Action Plan shall contain measures to be introduced to work towards achieving air quality objectives within the remaining AQMAs to improve health and wellbeing across the Council area.</p>
<p>2018 Updating & Screening Assessment</p>	<p>There were no exceedances of any objectives outside the existing AQMA boundaries, or within the Strand Road AQMA. No significant changes in emission sources or no new developments within the Derry and Strabane District Council area were identified that would significantly impact on air quality at relevant locations. In 2018, the Council revoked the Strabane, Newtownstewart and Castledearg AQMA's for particulates (PM₁₀). The former SDC Action Plan measures were realised and pollution levels reduced to well below health limit values. The Smoke Control Areas still remain. The Strand Road AQMA for nitrogen dioxide was revoked in 2018 and the Spencer Road AQMA was reduced in size to reflect updated monitoring and modelling results. The remaining AQMAs are considered appropriate for the time-being. The Council is revising the Air Quality Action Plan to reflect the new Council boundary. Measures shall be introduced to work towards achieving air quality objectives within the remaining AQMAs to improve health and wellbeing across the Council area.</p>

Derry City and Strabane District Council

The following Figures 1.1 – 1.4 show the AQMA's in the Derry City and Strabane District Council area. These 4 AQMA's are within the Derry area of the council. They have been declared for NO₂ from traffic sources.

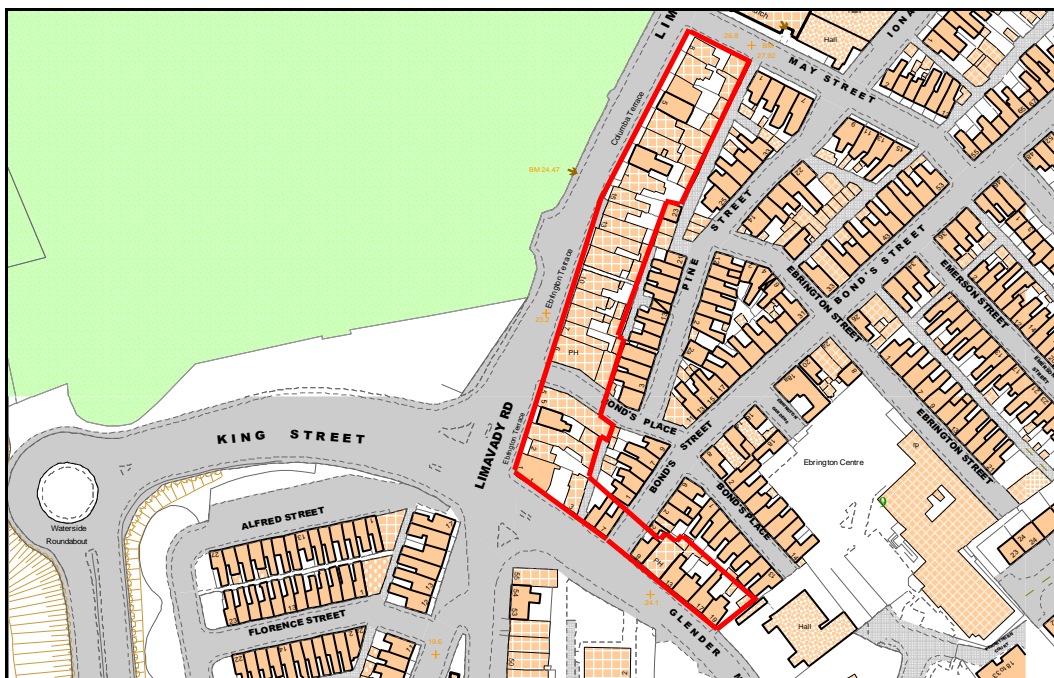
Maps of the AQMA's declared for Nitrogen Dioxide (Annual Mean)

Figure 1.1 – Creggan Road Air Quality Management Area



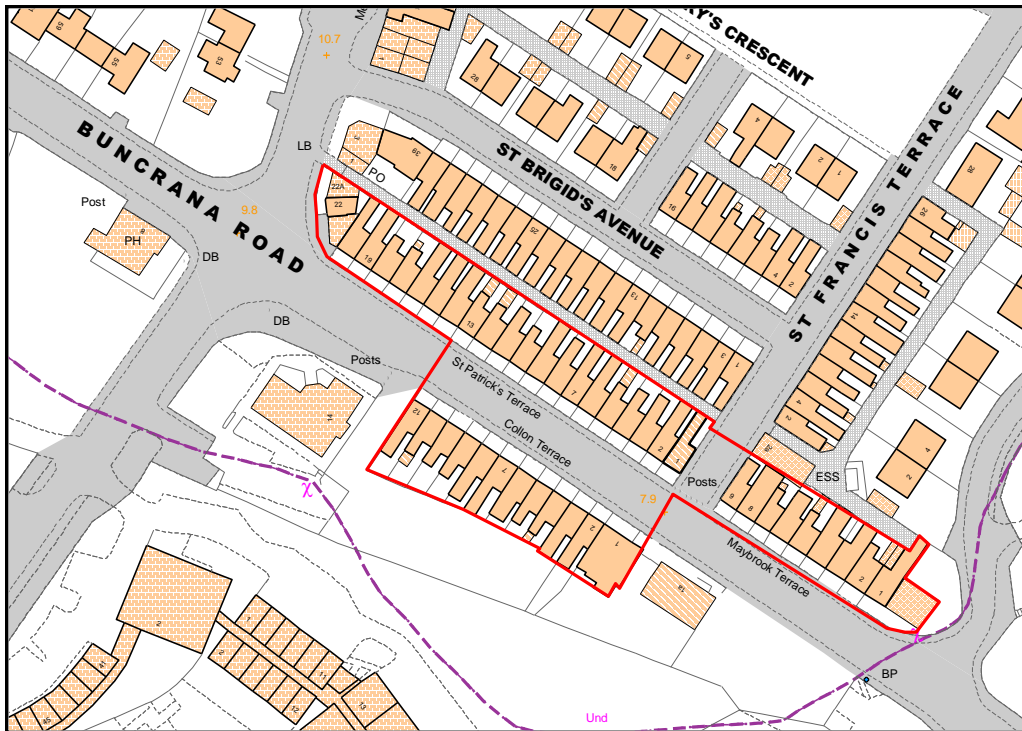
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Figure 1.2 – Dale's Corner Air Quality Management Area



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Figure 1.3 – Buncrana Road Air Quality Management Area



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Figure 1.4 – Spencer Road Air Quality Management Area



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2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

The Council monitored NO₂ at two locations in 2018; Derry Rosemount and Dale's Corner. PM₁₀ was monitored at Derry Rosemount, Bawnmore Place at Strathfoyle and the Springhill Park site in Strabane. PM_{2.5} was also monitored at Derry Rosemount, as was Ozone. The Council monitored SO₂ at two locations in 2018; Derry Rosemount and Springhill Park. Details of the automatic monitoring sites are summarised in Table 2.1 and shown in Figures 2.1 and 2.2.

Monitoring techniques used at the sites include; chemi-luminescence at Dale's Corner, FDMS and chemi-luminescent at Derry Rosemount, beta ray attenuation and UV florescence at Springhill Park and TEOM PM₁₀ at Bawnmore Place, Strathfoyle .

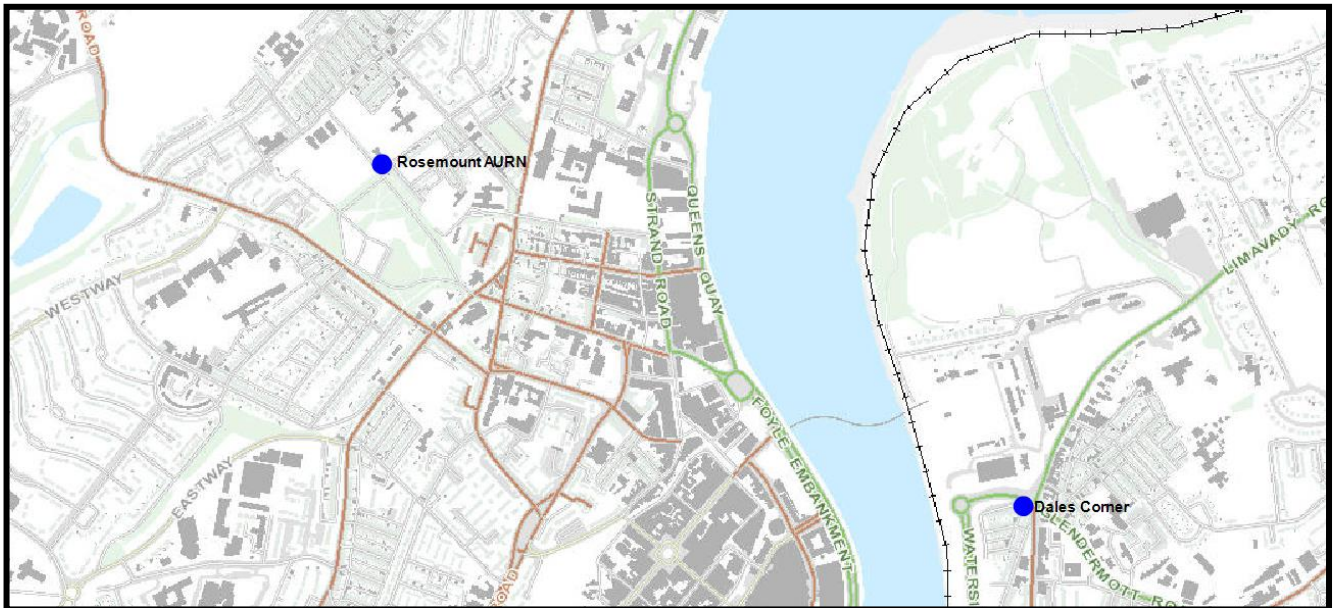
NO₂ concentrations were below both the annual mean at the Rosemount and Dale's Corner sites in all years and 1-hour objectives were below the threshold at Rosemount. However, there was 1 exceedance of the 1-hour objective at the Dale's Corner site in 2018, 1 exceedance of the 1-hour objective in 2017 and 4 exceedances of the of the 1-hour objective in 2016.

The Rosemount AURN site is managed to the UK Automatic Urban and Rural Network (AURN) QA standards .QA/QC details and overview monitoring graphs and exceedance statistics for the non-AURN sites are included in Appendix A.

Derry City and Strabane District Council

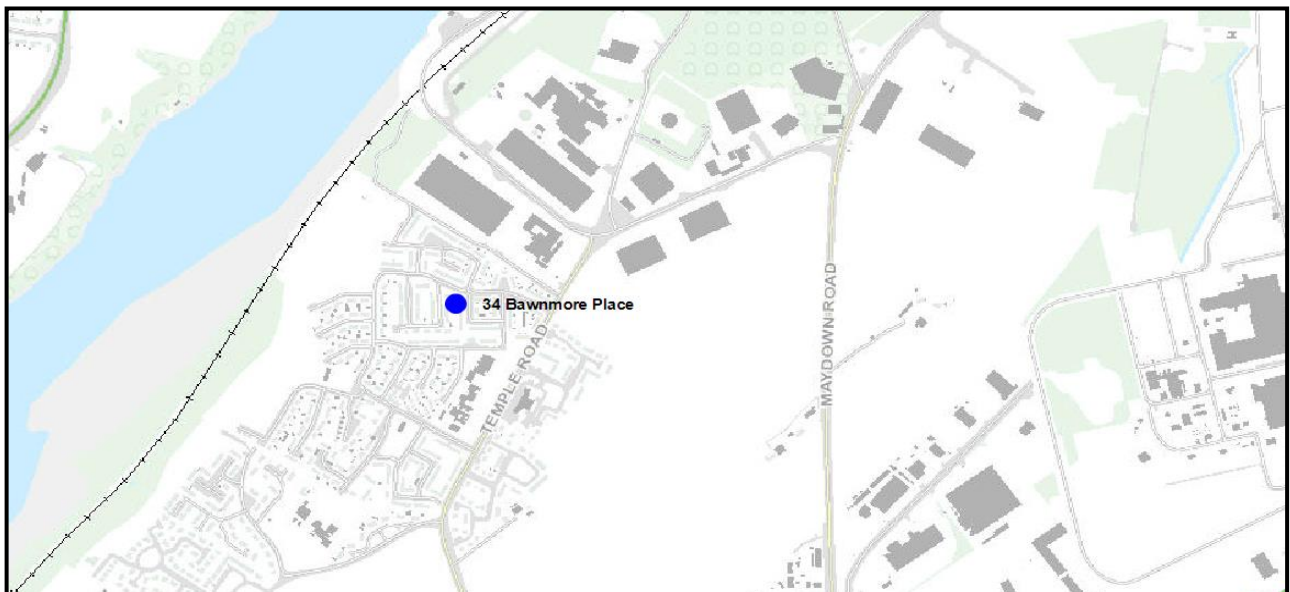
Figure 2.1 – Map of Automatic Monitoring Sites in Derry

Rosemount AURN and Dales Corner



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34 Bawnmore Place

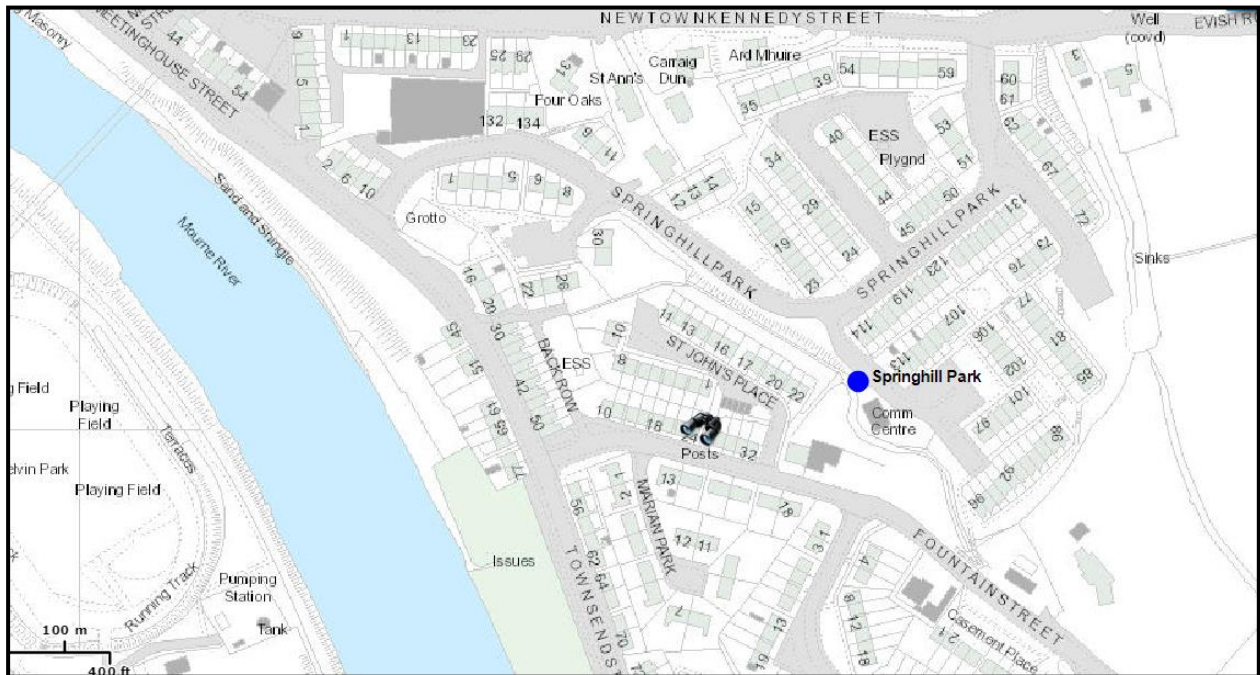


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Figure 2.2 Map of Automatic Monitoring Site in Strabane

2.2.1 – Springhill Park



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Table 2.1 – Details of Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Inlet Height (m)	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
Dales Corner	Roadside	244186	416761		NO ₂	N	chemiluminescence monitor	Y	3m	Y
Derry Rosemount	Urban	242850	417468		O ₃ , NO ₂	N	FDMS and chemiluminescence monitor	Y	161m	N/A
Strathfoyle	Suburban	247007	421004		PM ₁₀	N	TEOM	Y	27m	N/A
Springhill Park, Strabane	Urban Background	235175	397222		PM ₁₀ , SO ₂	N	beta ray attenuation and UV florescence	Y	2m	Y

2.1.2 Non-Automatic Monitoring Sites

The Council operated 24 Nitrogen Dioxide (NO₂) diffusion tube monitoring sites within its area in 2018 situated across Derry City. 50 tubes in all were exposed, with triplicate tubes at the continuous NO₂ monitoring stations at Dale's Corner and Rosemount and duplicate tubes at all other sites. The locations of these sites are shown in Figures 2.3 to 2.8 and described in detail in Table 2.2. The maps show current and historical monitoring locations since 2015.

It was decided to use the local bias correction factor for the NO₂ diffusion tubes and this is discussed later in Section 2.2.

Full details of the QA/QC procedure for the diffusion tubes are provided in Appendix A

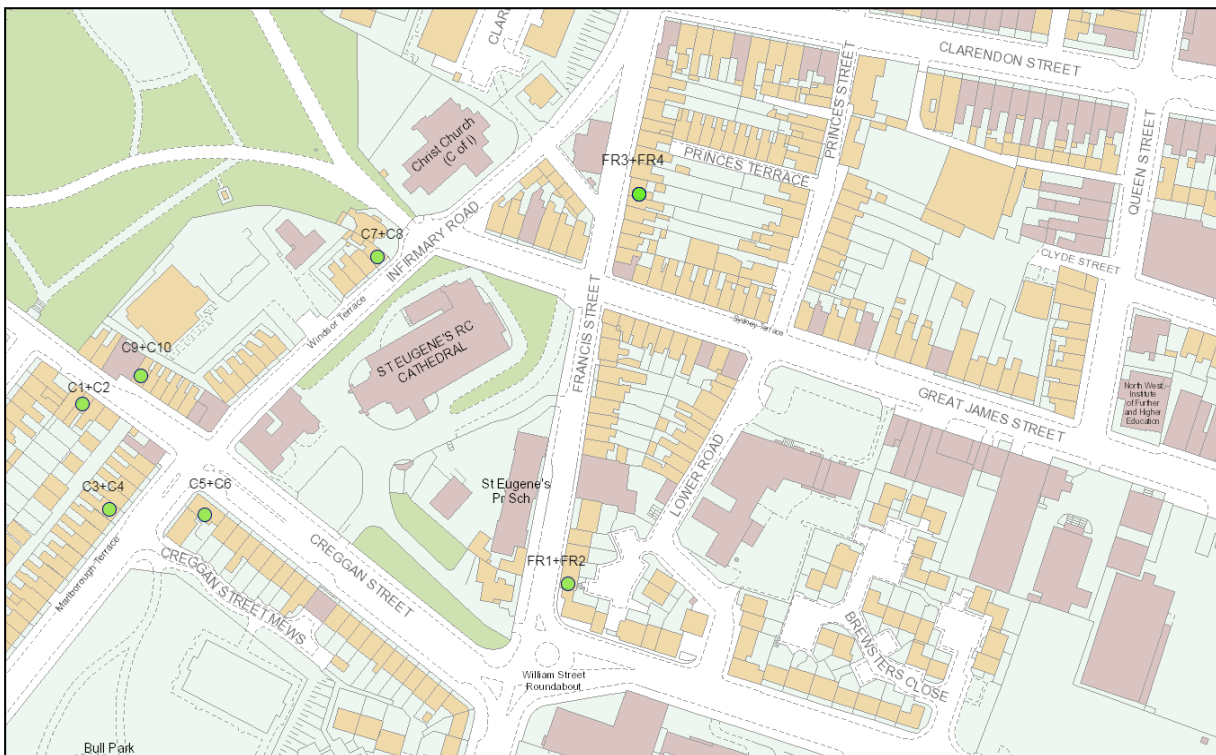
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Figure 2.3 – Map of Brooke Park (AURN) Non-Automatic Monitoring Sites



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Figure 2.4 - Map of Creggan Road, Marlborough Terrace, Windsor Terrace, Creggan Street and Francis Street Non- Automatic Monitoring Sites.



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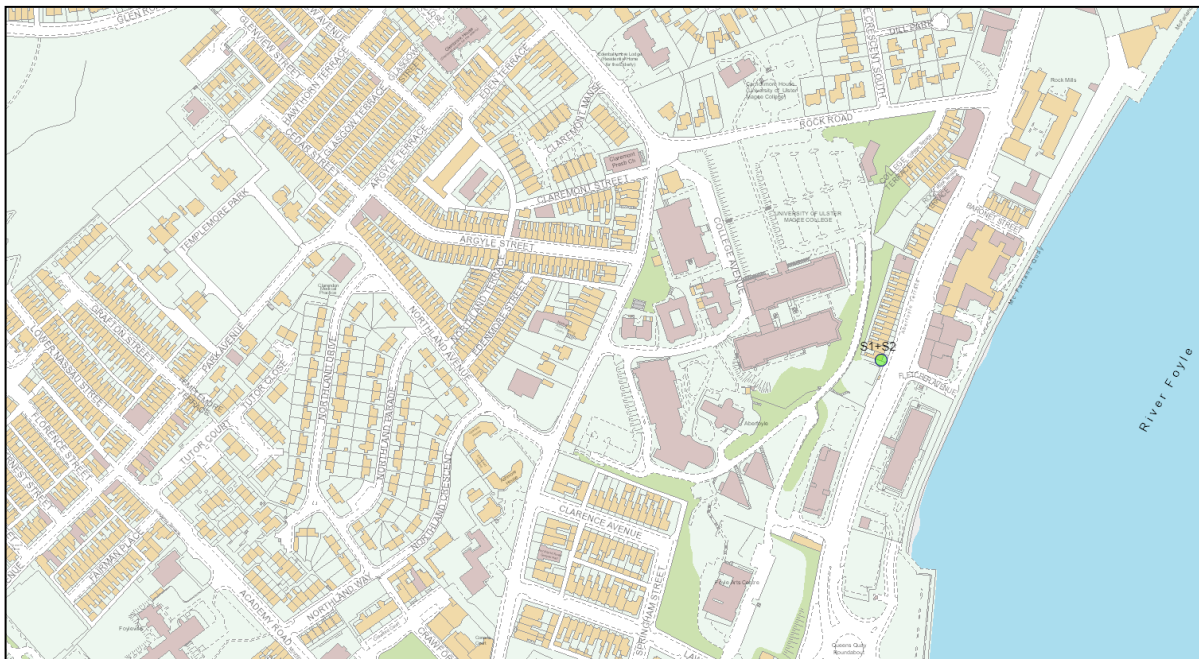
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Figure 2.7 Map of Spencer Road Non-Automatic Monitoring Site



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Figure 2.8 Map of Aberfoyle Terrace Non-Automatic Monitoring Site



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Table 2.2 – Details of Non- Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Site Height (m)	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	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?
A1-3	Urban background	242962	417217	2.5	NO2	N	Y (triplicate)	Y (161m)	161m	Y
C1-2	Roadside	242913	417144	2.5	NO2	Y	N (duplicate)	Y (0m)	1m	Y
C3-4	Roadside	242921	417101	2	NO2	Y	N (duplicate)	Y (0m)	4m	Y
C5-6	Urban Background	242959	417102	2	NO2	Y	N (duplicate)	Y (0m)	3m	Y
C7-8	Roadside	243017	417191	2	NO2	N	N (duplicate)	Y (0m)	3m	Y
C9-10	Roadside	242928	417148	2	NO2	Y	N (duplicate)	Y (0m)	3m	Y
D1-3	Roadside	244178	416760	1.5	NO2	N	N (triplicate)	Y (0m)	3m	Y
D4-5	Roadside	244210	416714	2.5	NO2	N	N (duplicate)	Y (0m)	5m	Y
D6-7	Roadside	244238	416753	2.5	NO2	Y	N (duplicate)	Y (0m)	1m	Y
D8-9	Roadside	244283	416718	2.5	NO2	Y	N (duplicate)	Y (0m)	1m	Y
D10-11	Roadside	244219	416794	3	NO2	Y	N (duplicate)	Y (0m)	4m	Y
D12-13	Roadside	244240	416856	2	NO2	Y	N (duplicate)	Y (0m)	4m	Y

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Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Site Height (m)	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	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?
D14-15	Roadside	244277	416931	1.5	NO2	Y	N (duplicate)	Y (0m)	4m	Y
D16-17	Roadside	244189	416756	2	NO2	N	N (duplicate)	Y (0m)	7.3m	Y
P1-2	Roadside	243449	419013	2	NO2	N	N (duplicate)	Y (0m)	5m	Y
P3-4	Roadside	243418	419016	2.5	NO2	N	N (duplicate)	Y (0m)	5m	Y
P5-6	Roadside	243571	418910	2	NO2	Y	N (duplicate)	Y (0m)	5m	Y
P7-8	Roadside	243480	418970	2	NO2	Y	N (duplicate)	Y (0m)	4m	Y
P9-10	Roadside	243539	418908	2	NO2	Y	N (duplicate)	Y (0m)	4m	Y
P11-12	Roadside	243519	418921	2	NO2	Y	N (duplicate)	Y (0m)	4m	Y
S7-8	Roadside	243483	417801	2	NO2	Y	N (duplicate)	Y (0m)	6m	N
SP1-2	Roadside	243557	417907	2.5	NO2	Y	N (duplicate)	Y (0m)	2m	Y
FR1-2	Roadside	243084	417075	3	NO2	N	N (duplicate)	Y (0m)	2m	Y
FR3-4	Roadside	243110	417225	3	NO2	N	N (duplicate)	Y (0m)	2m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO₂)

Automatic Monitoring Data

Details of results from both automatic monitoring sites, compared with the annual mean objective from 2014-2018, are documented in Table 2.3 and shown in Figure 2.9. The annual limit value of 40µg/m³ is shown by the red line. Comparison with the 1-hour mean Objective is also documented in Table 2.4. The Derry Rosemount site was commissioned in 2016, thus the limited data set for this site. The monitoring results to date at Rosemount show a level trend with concentrations of around 10µg/m³. There is an upward trend at the Dale's Corner site due to increased pollutant concentrations in the period 2014-2016. However, the annual mean has decreased slightly in 2017 to 36ug/m³ and further decreased again in 2018 to 32ug/m³ so that the upward trend is less pronounced than previously. The subsequent annual mean for 2019 has shown a further minor decrease to 31ug/m³ and this will be discussed in the next LAQM Updating and Screening Assessment (USA).

Automatic Monitoring Data

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 2018 % ^b	Annual Mean Concentration $\mu\text{g}/\text{m}^3$				
					2014* ^c	2015* ^c	2016* ^c	2017* ^c	2018* ^c
Derry Dale's Corner	Roadside	N	99%	99%	23	29	38	36	32
Derry Rosemount	Urban background	N	98%	98%	-	-	10	8	10

^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 per Boxes 7.9 and 7.10 of LAQM.TG16, if monitoring was not carried out for the full year.

*Annual mean concentrations for previous years are optional.

Trends in Annual Mean NO₂ Concentrations Measured at Automatic Monitoring Sites

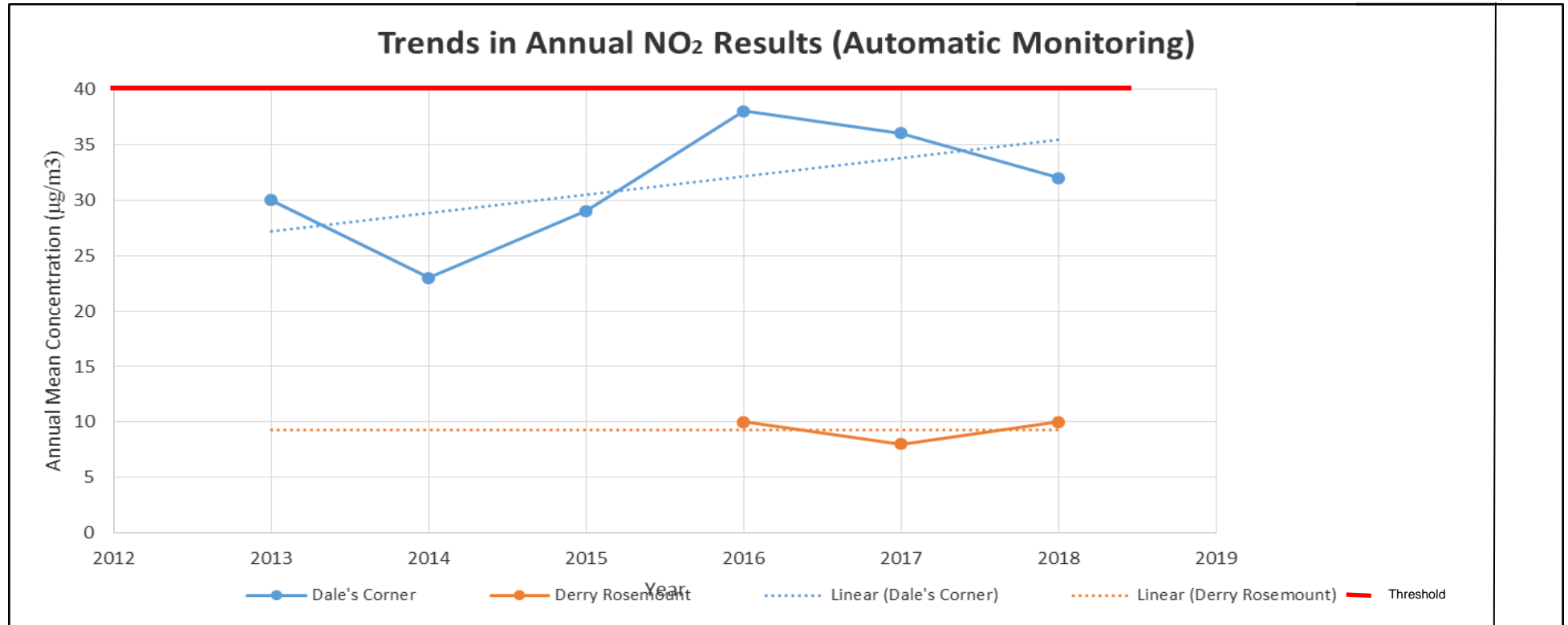


Figure 2.9

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 2017 % ^b	Number of Exceedances of Hourly Mean (200 µg/m ³)				
					2014* ^c	2015* ^c	2016* ^c	2017 ^c	2018
Derry Dale's Corner	Roadside	N	99%	99%	0 (172)	0 (183)	4 (224)	1 (205)	1(205)
Derry Rosemount	Urban background	N	98%	98%	-	-	0 (121)	0 (87)	0(86)

^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 85%, include the 99.8th percentile of hourly means in brackets

*Number of exceedances for previous years are optional.

In bold, exceedance of the NO₂ hourly mean AQS objective (200µg/m³ – not to be exceeded more than 18 times per year)

Diffusion Tube Monitoring Data

Long term trends have been illustrated in the following graphs for different locations within the AQMA's. Results of monitoring trends over the various periods 2010/11/12/13-2018 show that most locations with elevated pollutant concentrations within the AQMA's are projected to display decreases to below the pollutant objective values. This is encouraging and it is hoped that these trends continue. It must be acknowledged that the trends can be affected by several important parameters, not least the choice of bias correction factor. The local bias correction factor has shown a decrease to 0.71 in 2013 but then increased since 2014 reaching 0.86 in 2017. This then decreased in 2018 to 0.75.

Having previously used the local bias adjustment factors for LAQM reports since 2008, the Council choose to use the latest National Diffusion Tube Bias Adjustment Factor Spreadsheet for the 2018 USA report due to the substantial variance between the 2017 local bias adjustment factor of 0.86 compared to the 2017 national factor of 0.77 for the ESG laboratory at Didcot (using the 50% triethanolamine (TEA) in acetone preparation method) for DCSDC's tube analyses.

The Council has decided to use the 2018 localised factor of 0.75 for this report as opposed to the national factor of 0.77. It is suggested that preference should be given to the localised factor unless there are cases where the combined factor may be more representative: as the factors are close in value, this is not the case and thus the choice of the local factor.

Council will however continue to monitor trends and choice of bias adjustment factor as new monitoring data becomes available.

All diffusion tube monitors are located on façade of dwellings with the exception of the Rosemount AURN site and the Dale's Corner continuous roadside monitoring site. The tubes at the AURN site cannot be distance corrected as they are over 50m from kerb. At Dale's Corner, the distance correction calculator shows a reduction of over 3 ug/m³ to give an NO₂ annual mean concentration of 24.6 ug/m³ at the façade of the nearest dwelling.

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The NO₂ diffusion tube data is summarised in Table 2.5 and 2.6 (Exceedances shown in bold). The annual mean objective was exceeded using both local and national factors at three sites in each of the years 2014, 2015, 2016, 2017 and 2018. This contrasts with the findings of the last USA report when the annual mean objective was exceeded at ten sites in each of the years 2014, 2015, 2016, 2017 and 2018. It is hoped this is a strong indication of a drop in overall NO₂ pollution levels from traffic sources. No exceedances have been recorded outside the existing AQMAs within the past number of years.

The following sites were found to be exceeding in 2014:

- C1-2 (Creggan Road AQMA);
- C11-13 (Creggan Road AQMA);
- D6-7 (Dale's Corner AQMA) only when using the national bias adjustment factor;
- D8-9 (Dale's Corner AQMA);
- D10-11 (Dale's Corner AQMA); and
- P11-12 (Buncrana Road AQMA) only when using the national bias adjustment factor.

The following sites were found to be exceeding in 2015:

- C1-2 (Creggan Road AQMA);
- D6-7 (Dale's Corner AQMA);
- D8-9 (Dale's Corner AQMA);
- D10-11 (Dale's Corner AQMA) and
- P11-12 (Buncrana Road AQMA)

The following sites were found to be exceeding in 2016:

- C1-2 (Creggan Road AQMA);
- C9-10 (Creggan Road AQMA);
- D6-7 (Dale's Corner AQMA);
- D8-9 (Dale's Corner AQMA);
- D10-11 (Dale's Corner AQMA);
- D14-15 (Dale's Corner AQMA) only when using the local bias adjustment factor and
- P11-12 (Buncrana Road AQMA);

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The following sites were found to be exceeding in 2017:

- C1-2 (Creggan Road AQMA);
- C3-4 (Creggan Road AQMA);
- D6-7 (Dale's Corner AQMA);
- D8-9 (Dale's Corner AQMA);
- D10-11 (Dale's Corner AQMA);
- D12-13 (Dale's Corner AQMA); and
- P11-12 (Buncrana Road AQMA)

The following sites were found to be exceeding in 2018:

- C1-2 (Creggan Road AQMA);
- D6-7 (Dale's Corner AQMA);
- D8-9 (Dale's Corner AQMA) and;
- D10-11 (Dale's Corner AQMA)

The above illustrates a marked decline in the number of exceedences at monitored locations within the AQMA's. The Spencer Road AQMA has not shown exceedance for the last 5 years. The Buncrana Road AQMA has not shown exceedences for the first time in 2018 using both bias correction factors.

Creggan Road AQMA

Exceedances of the annual mean NO₂ objective continue to occur within the AQMA as shown by the monitoring results. Diffusion tube monitoring site C1-2 showed concentrations greater than 60µg/m³ using the local bias adjustment factor in 2017 but this figure dropped to 53.6µg/m³ in 2018 using the local bias adjustment factor and 55.1µg/m³ using the national factor. It is therefore recommended that this AQMA remains as declared.

Dale's Corner AQMA

Exceedances of the annual mean NO₂ objective continue to occur within the AQMA as shown by the monitoring results. The highest bias adjusted exceedence is now 44.5ug/m³ at 19 Glendermott Road. It is therefore recommended that this

AQMA remains as declared.

Buncrana Road AQMA

Exceedance of the annual mean NO₂ objective was recorded at only one site within the AQMA (P11-12) since 2014. When using the national bias adjustment factor, this site was only marginally exceeding the pollutant objective value in 2017 with a concentration of 40.6 ug/m³. In 2018 using both the local and national bias adjustment factor the concentrations were below the annual mean NO₂ objective. Measurements at all other sites within this AQMA have remained below the objective in the last 5 years. A proposed road widening scheme for this section of the A2 is currently undergoing public consultation. The preferred route would appear to follow the existing road with vesting of all properties along Collon Terrace and the construction of a roundabout at the current cross junction at Buncrana Road/ Racecourse Road. As exceedance of the pollutant objective value is only occurring at one location on Collon Terrace, relevant public exposure will be removed at this location and it may be possible to revoke the AQMA. However, monitoring shall continue at other residential locations within the AQMA to determine the effects on air quality from the new road scheme.

Spencer Road AQMA

No exceedances have been recorded within the Spencer Road AQMA since 2014. However, site SP1-2 showed concentrations close to the annual mean NO₂ objective using the local bias adjustment factor in 2016 and 2017. Using the national bias adjustment factor for 2017, the NO₂ concentration was 34.5 ug/m³. In 2018 this figure reduced further to 33.8 ug/m³ using the national bias adjustment factor and to 32.9 ug/m³ using the local bias adjustment factor.

On 16th October 2018, under the Derry City and Strabane District Council Air Quality Management Area No 4 Order, the AQMA at Spencer Road was reduced in size. The AQMA formerly incorporated numbers 32 to 70a Spencer Road under the Derry City Council Air Quality Management Area No 3 Order and was changed to incorporate numbers 66 to 70a Spencer Road.

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Based on the sustained decrease in annual mean concentrations over the last 5 years, Council is recommending that this AQMA should be revoked.

Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes in 2018

Site ID	Location	Site Type	Within AQMA?	Triplet or Collocated Tube	Data Capture 2018 (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 2018 ($\mu\text{g}/\text{m}^3$)	
								Local Bias Adjustment factor = 0.75	National Bias Adjustment factor = 0.77
A1-3	AURN	B	N	Triplicate	12 months	N	N/A	11.2	11.5
C1-2	3 Creggan road	R	Y	Duplicate	12 months	N	N/A	53.6	55.1
C3-4	6 Marlborough Terrace	R	Y	Duplicate	12 months	N	N/A	28.9	29.6
C5-6	22a Creggan Street	R	Y	Duplicate	12 months	N	N/A	33.6	34.5
C7-8	1 Windsor Terrace	R	N	Duplicate	12 months	N	N/A	21.9	22.5
C9-10	14 Creggan Road	R	N	Duplicate	7 months	N	N/A	36.8	37.7
D1-3	Dale's Corner	R	N	Duplicate	12 months	N	Y (24.6 $\mu\text{g}/\text{m}^3$)	27.9	28.7
D4-5	52 Clooney Terrace	R	N	Duplicate	12 months	N	N/A	25	25.7
D6-7	5 Glendermott Road	R	Y	Duplicate	12 months	N	N/A	40.6	41.7
D8-9	19 Glendermott Road	R	Y	Duplicate	12 months	N	N/A	44.5	45.6
D10-11	4 Ebrington Terrace	R	Y	Duplicate	12 months	N	N/A	44.1	45.3
D12-13	12 Ebrington Terrace	R	Y	Duplicate	9 months	N	N/A	34.3	35.2
D14-15	9 Columba Terrace	R	Y	Duplicate	12 months	N	N/A	27.7	28.4
D16-17	17 Melrose Terrace	R	N	Duplicate	11 months	N	N/A	27.1	27.8
P1-2	53 Messines Park	R	N	Duplicate	12 months	N	N/A	20	20
P3-4	57 Messines Park	R	N	Duplicate	12 months	N	N/A	24	24.6

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Site ID	Location	Site Type	Within AQMA?	TriPLICATE or Collocated Tube	Data Capture 2018 (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 2018 ($\mu\text{g}/\text{m}^3$)	
								Local Bias Adjustment factor = 0.75	National Bias Adjustment factor = 0.77
P5-6	8 Maybrook Terrace	R	Y	Duplicate	12 months	N	N/A	24.5	25.2
P7-8	19 St Patricks Terrace	R	Y	Duplicate	12 months	N	N/A	30.3	31.1
P9-10	1 Collon Terrace	R	Y	Duplicate	12 months	N	N/A	31.5	32.3
P11-12	5 Collon Terrace	R	Y	Duplicate	12 months	N	N/A	38	39
S7-8	35 Aberfoyle Terrace	R	Y	Duplicate	12 months	N	N/A	25.3	26
SP1-2	70 Spencer Road	R	Y	Duplicate	12 months	N	N/A	32.9	33.8
FR1-2	3 Francis Street	R	N	Duplicate	12 months	N	N/A	25.2	25.8
FR3-4	45 Francis Street	R	N	Duplicate	12 months	N	N/A	26.2	26.9

^b If an exceedance is measured at a monitoring site not representative of public exposure, NO₂ concentration at the nearest relevant exposure should be estimated based on the [NO₂ fall-off with distance calculator](https://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html) (<https://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html>), and results should be discussed in a specific section. The procedure is also explained in paragraphs 7.77 to 7.79 of LAQM.TG16.

Table 2.6 Results of Nitrogen Dioxide Diffusion Tubes, using Local and National Bias Adjustment Factors (2014 to 2018)

Site ID	Site Type	Within AQMA?	2014		2015		2016		2017		2018	
			Local Bias Adjustment Factor = 0.87	National Bias Adjustment Factor = 0.76	Local Bias Adjustment Factor = 0.71	National Bias Adjustment Factor = 0.76	Local Bias Adjustment Factor = 0.79	National Bias Adjustment Factor = 0.76	Local Bias Adjustment Factor = 0.86	National Bias Adjustment Factor = 0.76	Local Bias Adjustment Factor = 0.75	National Bias Adjustment Factor = 0.77
A1-3	AURN	N			-		13.4	12.4	11.8	10.6	11.2	11.5
C1-2	3 Creggan road	Y	53.4	60.9	59.3	59.3	63.2	58.6	66.1	59.2	53.6	55.1
C3-4	6 Marlborough Terrace	Y	28.9	33.0	34.4	34.4	37.5	34.8	52.2	46.7	28.9	29.6
C5-6	22a Creggan Street	Y	33.7	38.4	38.4	38.4	37.6	34.9	39.8	35.6	33.6	34.5
C7-8	1 Windsor Terrace	N	18.5	21.1	21.2	21.2	21.2	19.7	31.9	28.6	21.9	22.5
C9-10	14 Creggan Road	N	34.1	38.9	39.0	39.0	43.5	40.4	30.9	27.7	30.6	29
D1-3	Dale's Corner	N	26.3	30.0	29.7	29.7	32.2	29.9	30.4	27.2	27.9	28.7
D4-5	52 Clooney Terrace	N	22.9	26.1	25.9	25.9	28.1	26.1	28.8	25.8	25	25.7
D6-7	5 Glendermott Road	Y	38.8	44.3	43.5	43.5	49.6	46.0	48.7	43.6	40.6	41.7
D8-9	19 Glendermott Road	Y	42.5	48.5	47.4	47.4	52.6	48.8	49.7	44.5	44.5	45.6
D10-11	4 Ebrington Terrace	Y	43.5	49.6	45.8	45.8	46.8	43.4	50.7	45.4	44.1	45.3
D12-13	12 Ebrington Terrace	Y	31.9	36.4	30.8	30.8	30.1	27.9	44.9	40.2	34.3	35.2
D14-15	9 Columba Terrace	Y	26.1	29.8	36.1	36.1	40.8	37.9	37.3	33.4	27.7	28.4
D16-17	17 Melrose Terrace	N	25.6	29.2	28.6	28.6	31.1	28.9	33.1	29.6	27.1	27.8

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Site ID	Site Type	Within AQMA?	2014		2015		2016		2017		2018	
			Local Bias Adjustment Factor = 0.87	National Bias Adjustment Factor = 0.76	Local Bias Adjustment Factor = 0.71	National Bias Adjustment Factor = 0.76	Local Bias Adjustment Factor = 0.79	National Bias Adjustment Factor = 0.76	Local Bias Adjustment Factor = 0.86	National Bias Adjustment Factor = 0.76	Local Bias Adjustment Factor = 0.75	National Bias Adjustment Factor = 0.77
			P1-2	53 Messines Park	N	16.5	18.8	19.2	19.2	21.2	19.7	22.9
P3-4	57 Messines Park	N	22.4	25.6	24.5	24.5	26.8	24.9	24.8	22.2	24	24.6
P5-6	8 Maybrook Terrace	Y	22.0	25.1	26.7	26.7	28.1	26.1	27.7	24.8	24.5	25.2
P7-8	19 St Patricks Terrace	Y	25.2	28.7	30.9	30.9	37.3	34.6	31.8	28.5	30.3	31.1
P9-10	1 Collon Terrace	Y	30.1	34.3	36.4	36.4	37.0	34.3	38.2	34.2	31.5	32.3
P11-12	5 Collon Terrace	Y	35.4	40.4	41.1	41.1	43.5	40.4	45.4	40.6	38	39
S7-8	35 Aberfoyle Terrace		23.2	26.5	27.5	27.5	29.6	27.5	32.3	28.9	25.3	26
SP1-2	70 Spencer Road		32.8	37.4	37.2	37.2	39.4	36.6	38.5	34.5	32.9	33.8
FR 1-2	3 Francis Street	N	25.1	28.6	27.1	27.1	30.1	27.9	29.4	26.3	25.2	25.8
FR 3-4	45 Francis Street	N	24.7	28.2	27.5	27.5	30.8	28.6	29.8	26.7	26.2	26.9

The Local Bias Adjustment Factor for 2018 is 0.75 and the National Bias Adjustment Factor is 0.77.
Diffusion Tube C9-C10 has been annualised- See Appendix E

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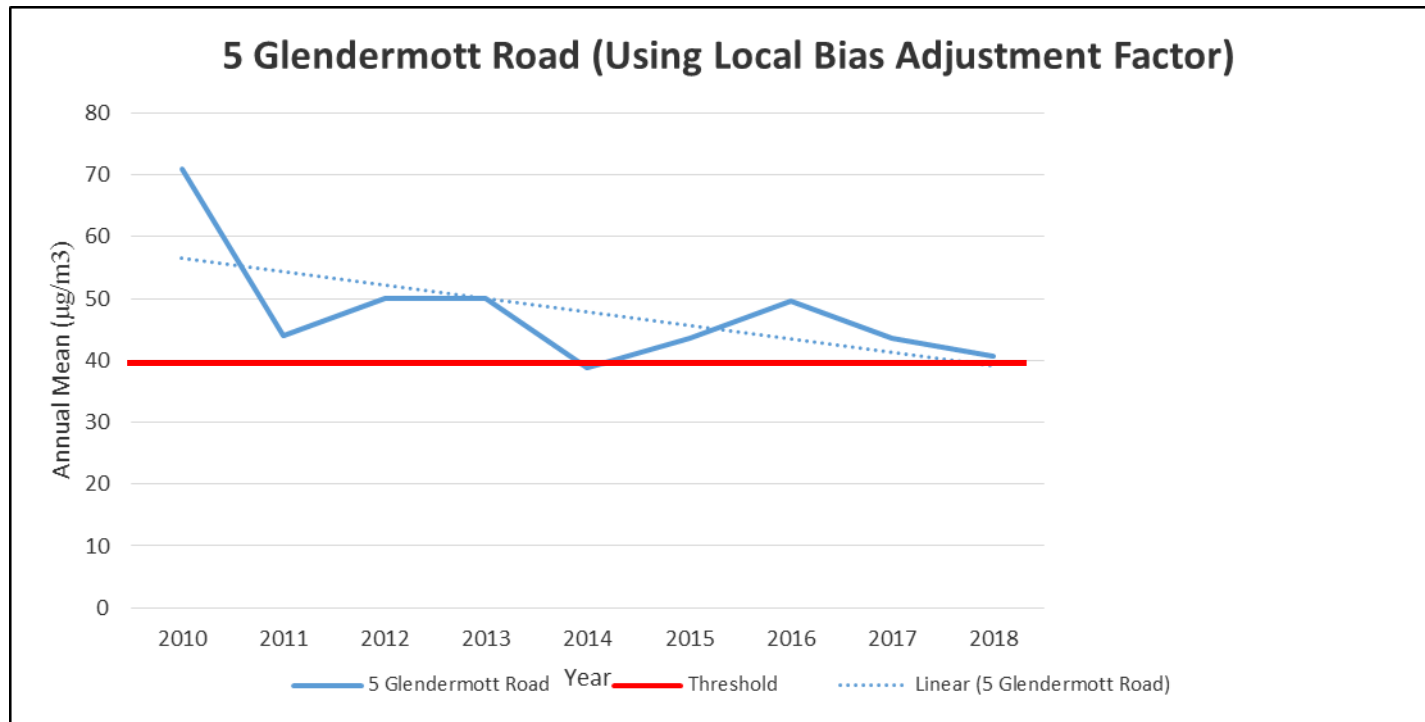
The following section considers the use of both the local and the national bias adjustment factors to demonstrate trends in NO₂ concentrations at locations within the AQMA's. Figures 2.9 - 2.20 show these trends.

Dale's Corner AQMA

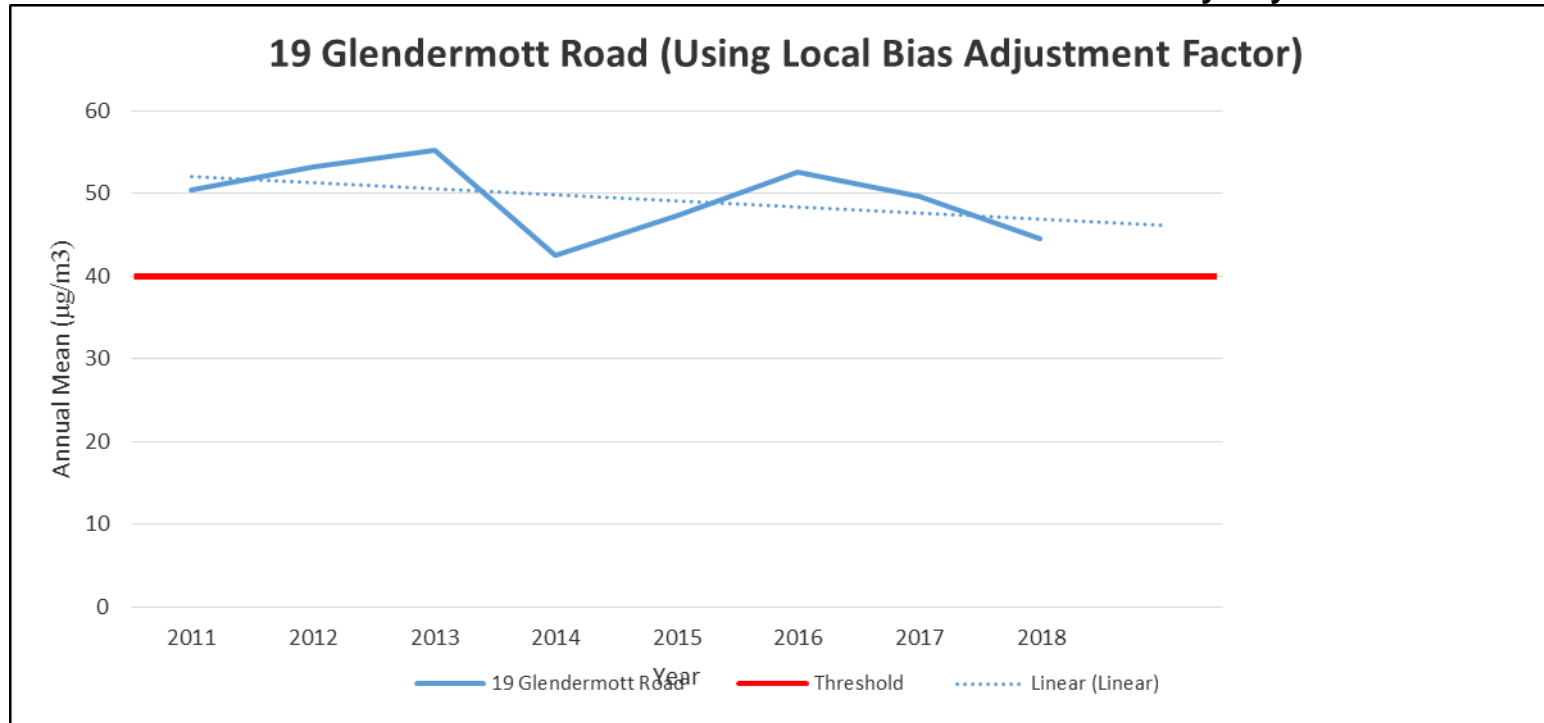
Considering longer term data and updating from the last LAQM report submitted to include 2018 data with the use of the local bias adjustment factor, it can be seen in Figures 2.10 and 2.12 that sites within the AQMA at Dale's Corner, namely No.4 Ebrington Terrace and No. 5 Glendermott Road show a larger decrease in projected pollutant concentrations than No.19 Glendermott Road (Figure 2.11), with the trend suggesting that levels should have been below the annual mean NO₂ limit value of 40ug/m³ as indicated in red on the graph, for No. 5 Glendermott Road and No.4 Ebrington Terrace by 2018. As discussed in the last 2018 USA report, the general increase from 2014 to 2016 has still negatively altered the overall downward trend and may account for why levels are currently above the limit value. The downward trend at No.19 Glendermott Road is less pronounced and would suggest that the limit value will be met around 2024 but the trend has been downwards in the last two years.

Figure 2.13 shows the general downward trend for all 3 sites in the Dale's Corner AQMA. It should be noted that this downward trend is less pronounced as only 5 years data has been used as opposed to 8 or 9 years data for the individual graphs.

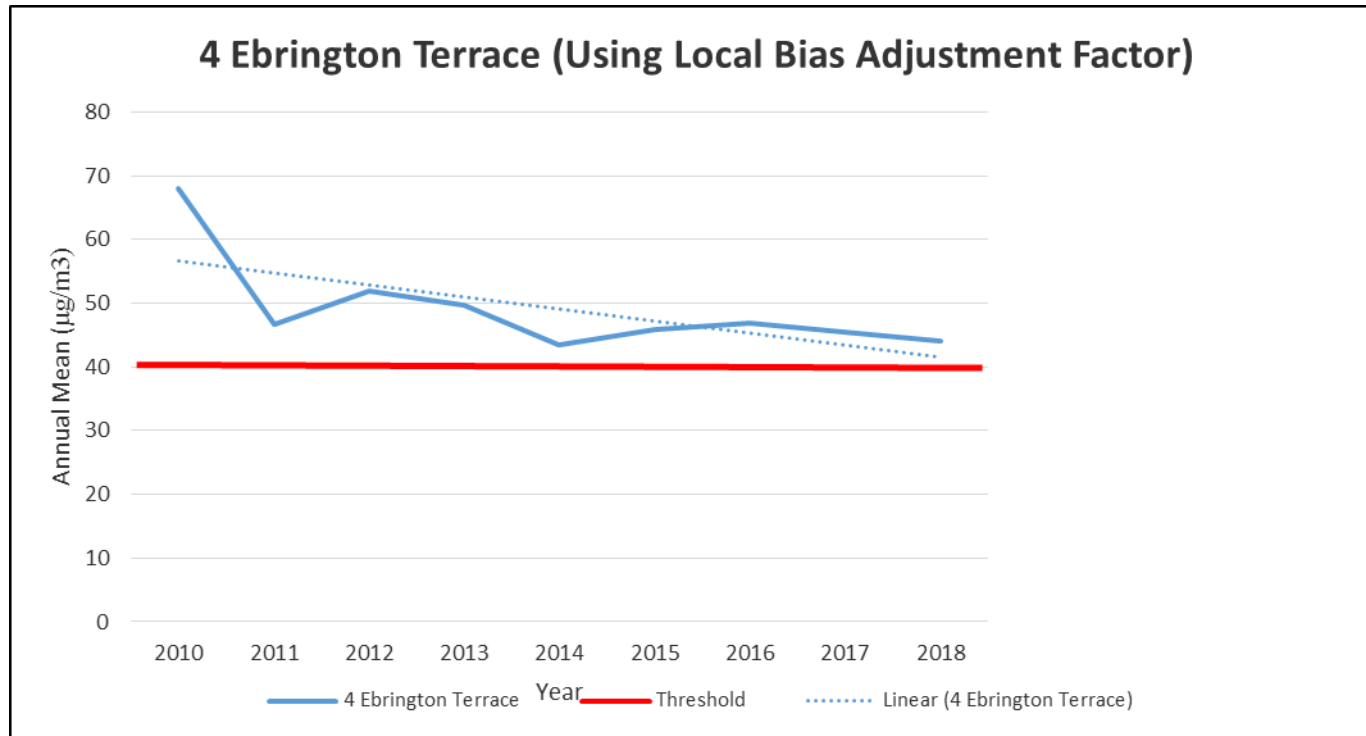
Figure 2.10 - 2.20 Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites



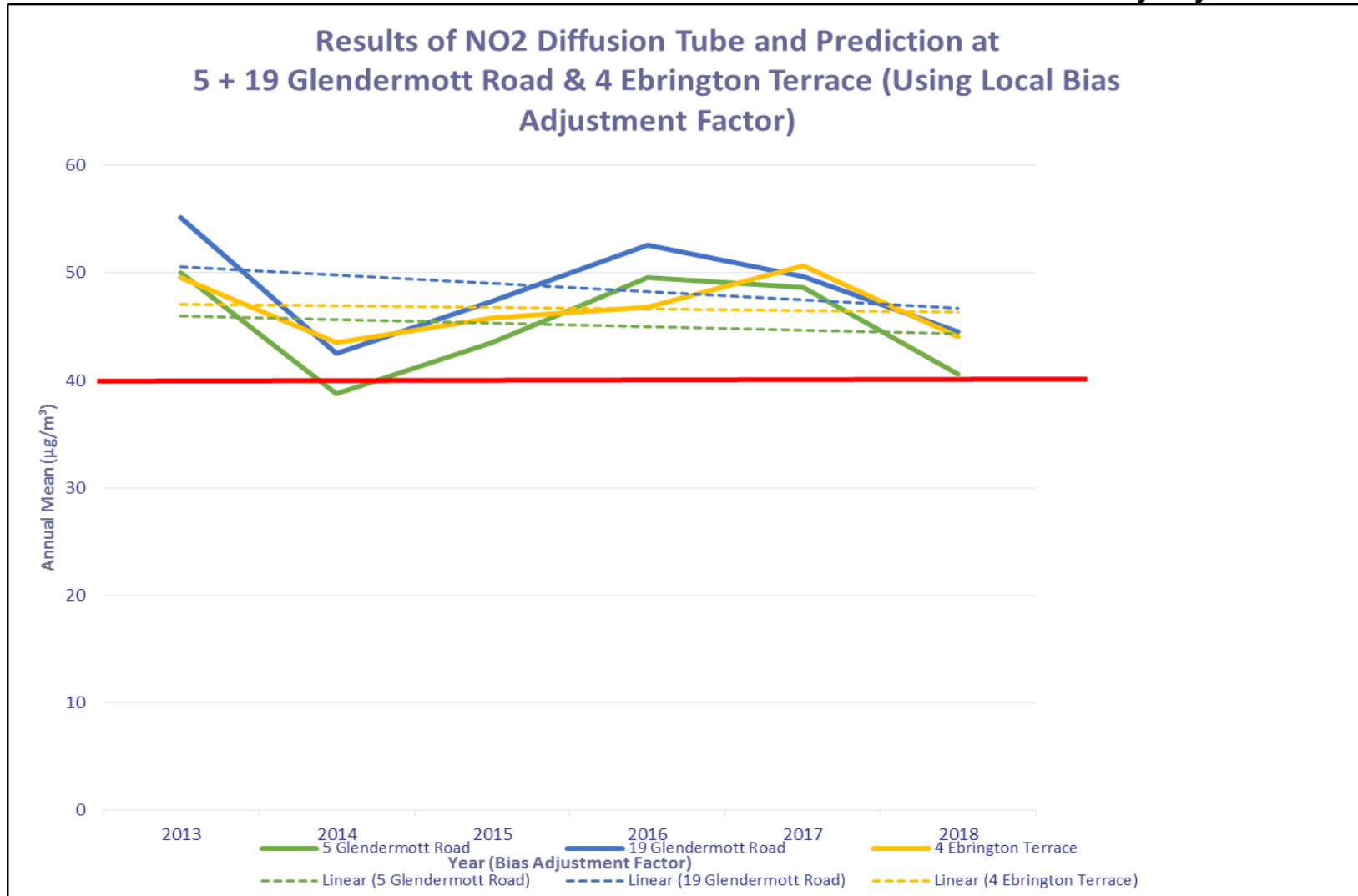
(Fig 2.10)



(Fig. 2.11)



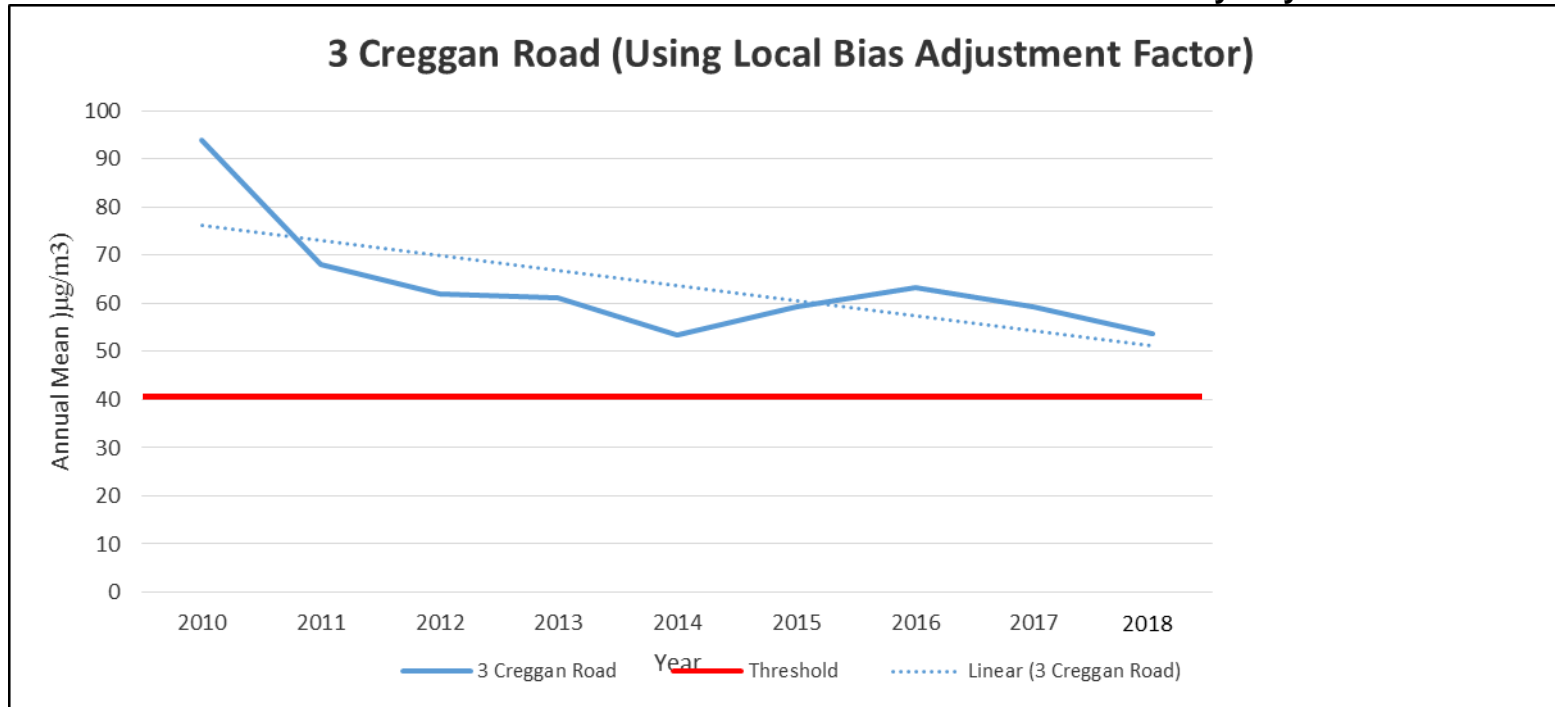
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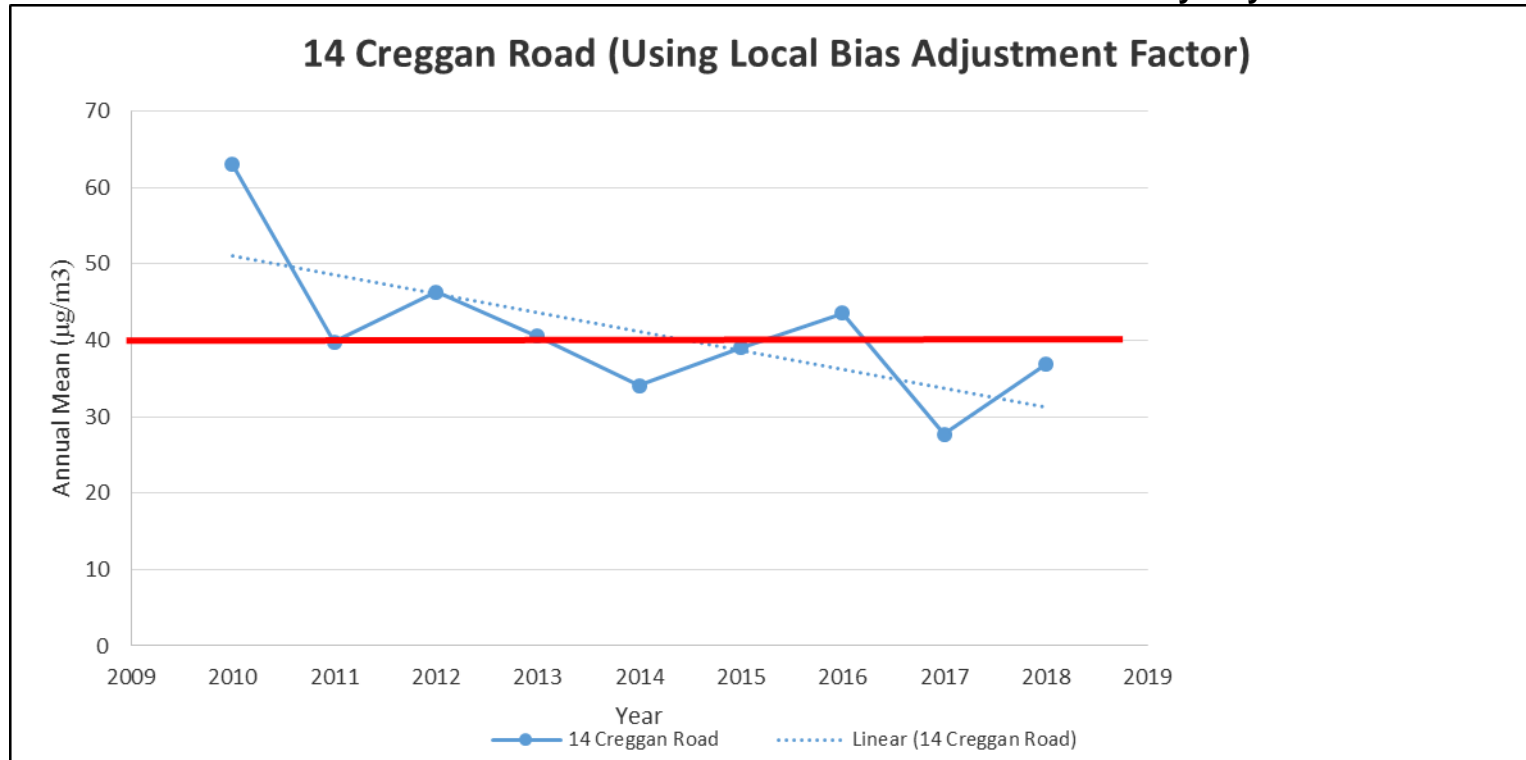
(Fig 2.13)

Creggan Road AQMA

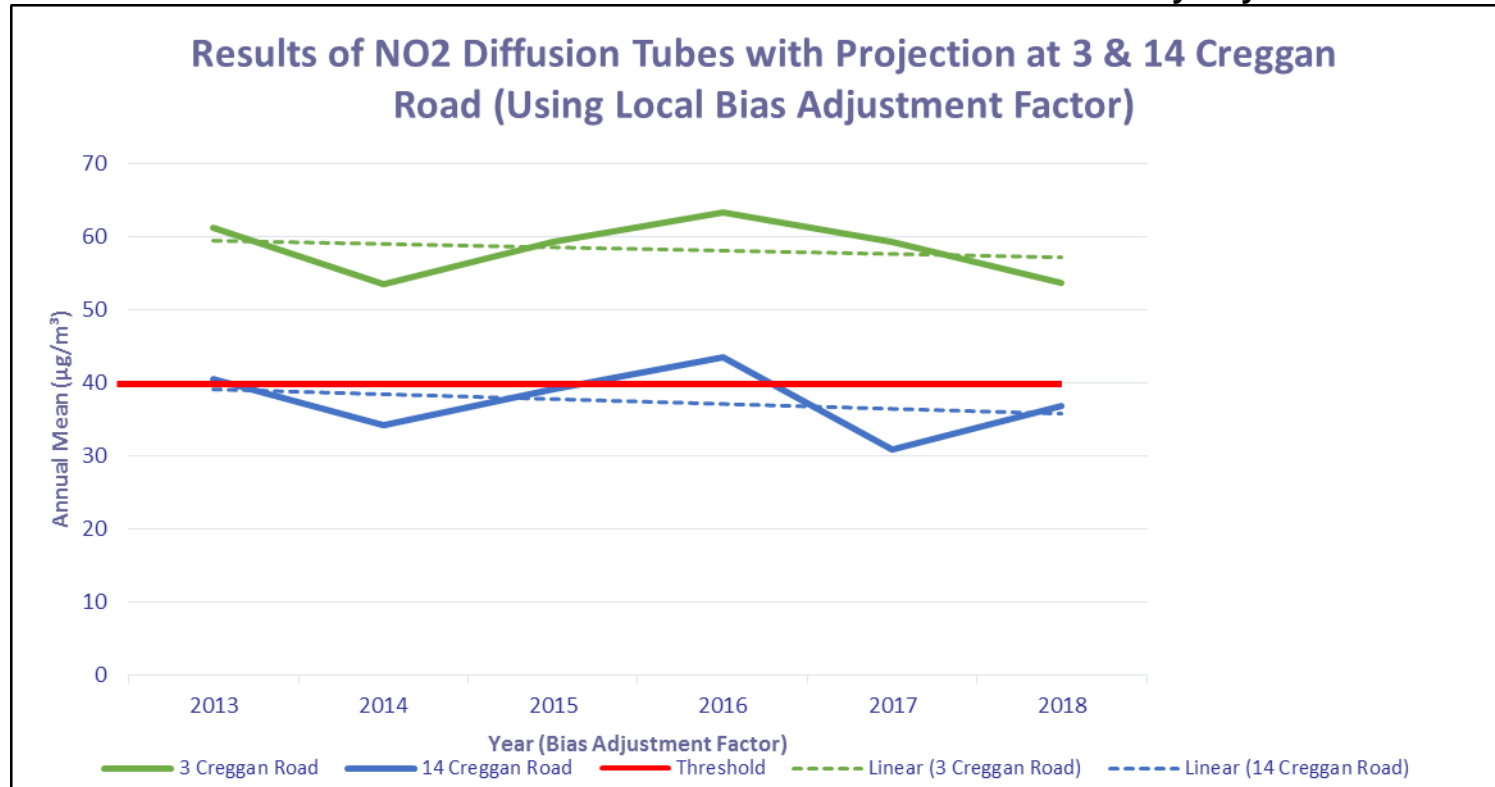
Again, considering longer term data since 2010 and updating from the last LAQM report submitted to include 2018 data (using the local bias correction factor), it can be seen in Figure 2.14 that No.3 Creggan Road is projected to be below the annual mean NO₂ limit value of 40ug/m³ as indicated in red on the graph, by 2022. At No.14 Creggan Road (Figure 2.15), it is projected that concentrations should have been below the annual mean NO₂ limit value by 2014 and to continue to be below the threshold. As for Dale's Corner, the general increase from 2014 to 2016 has negatively altered the overall downward trend and may account for why levels should not go or stay below the limit value earlier. Both the longer term data for 2010-2018 for No.3 Creggan Road and the 6 year period 2013-2018 show a downward trend.



(Fig 2.14)



(Fig 2.15)



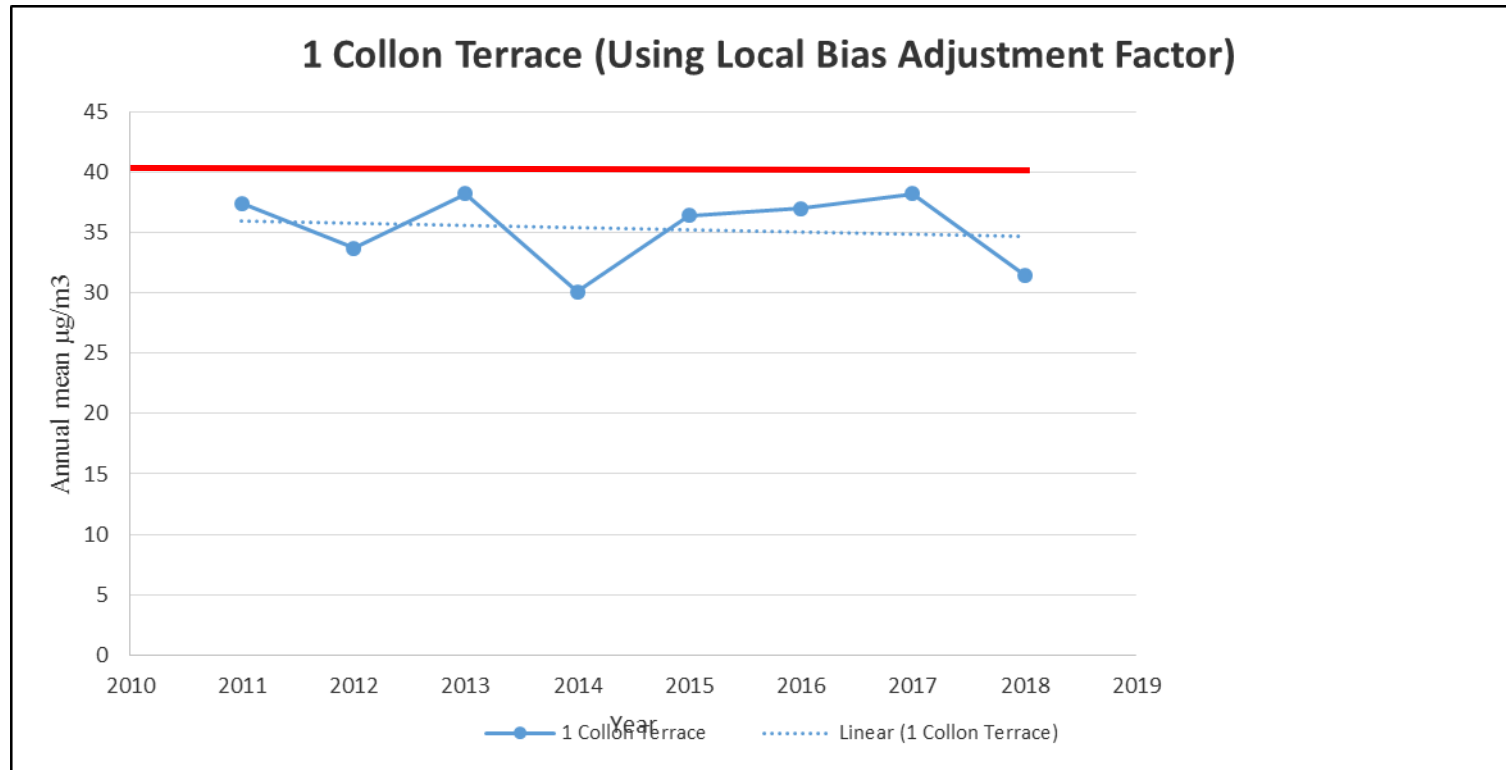
(Fig 2.16)

Buncrana Road AQMA

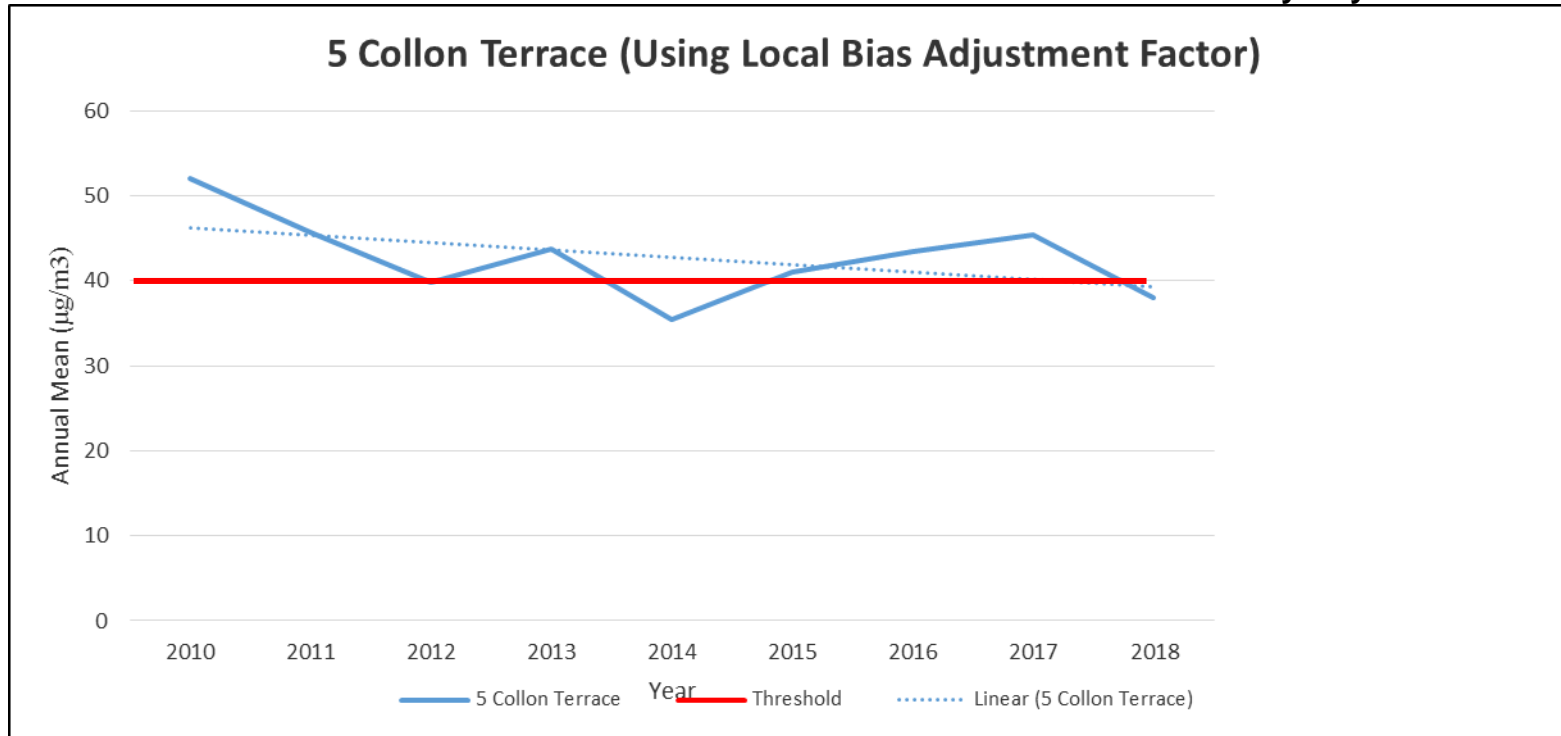
Again, considering longer term data since 2010 and updating from the last LAQM report submitted to include 2018 data (using the local bias correction factor), Figure 2.17 shows that No.1 Collon Terrace is consistently below the annual mean limit value whilst No. 5 Collon Terrace (Figure 2.18) is projected to have been below the annual mean NO₂ limit value of 40ug/m³ as indicated in red on the graph, by 2017.

As is the case for the other 2 AQMA's, the general increase at the Buncrana Road AQMA from 2014 to 2016 has negatively altered the overall downward trend and may account for why levels were not below the limit value earlier. The trend suggests that concentrations at No 1 Collon Terrace would appear to have evened out with a slight further decrease whilst there is a pronounced downward trend at No. 5 Collon Terrace. However, the 6 year period 2013-2018 (Figure 2.19), shows a slight upward trend at No. 1 Collon Terrace and a slight downward trend at no. 5 Collon Terrace. This is reflective of how the pollutant concentrations can vary over the years and the importance of the value of the bias correction factor. Referring back to Table 2.6, with the use of both the national and local bias correction factors, pollutant concentrations at No.5 Collon Terrace are below the threshold for the first time since 2014 when the use of the local factor gave a concentration of 35.4ug/m³.

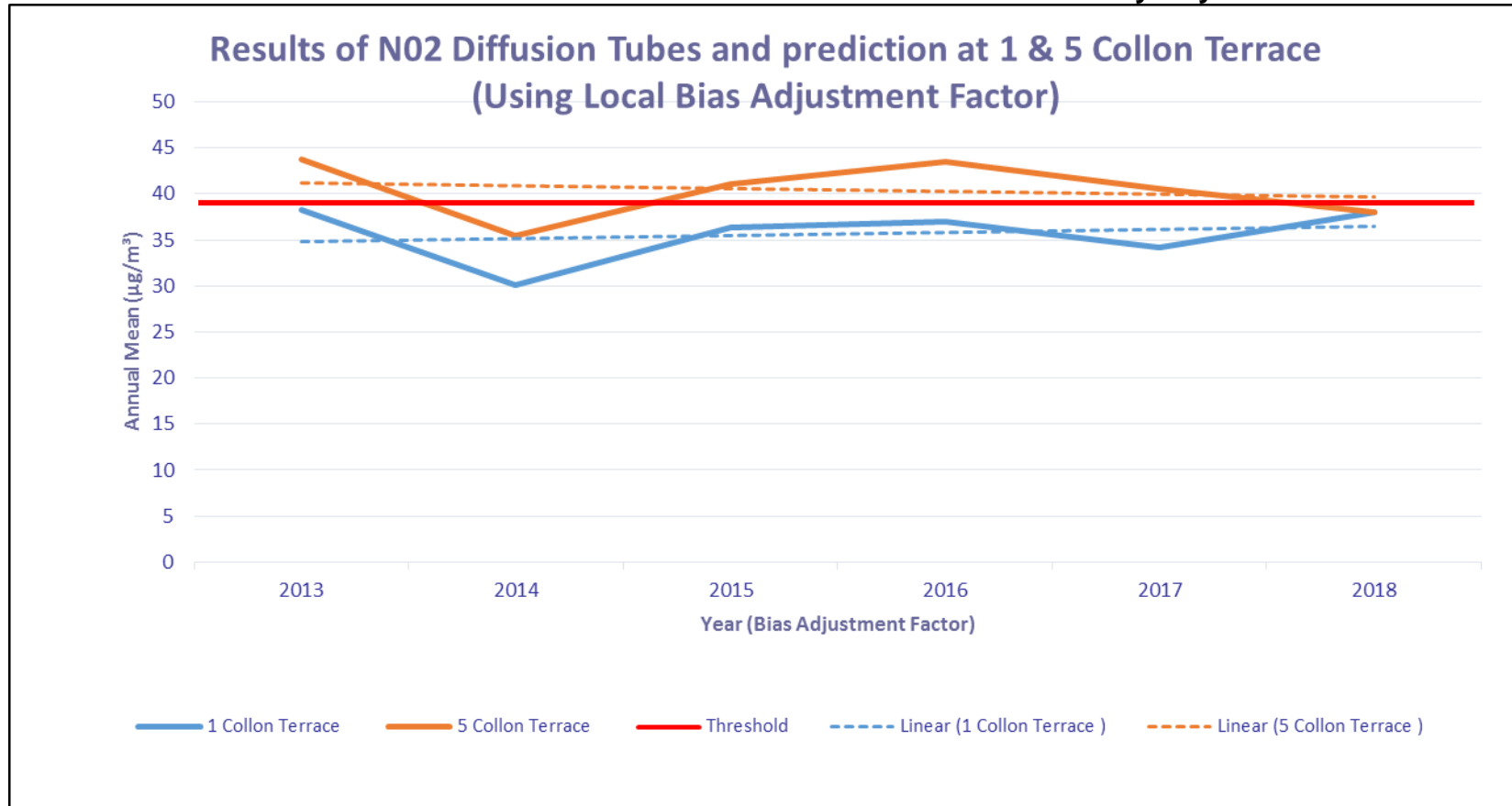
As mentioned previously, a proposed road widening scheme for a section of the A2 road is currently undergoing public consultation with the preferred route following the existing road with vesting and demolition of all properties along Collon Terrace. As exceedance of the pollutant objective value is only occurring at one location on Collon Terrace, relevant public exposure will be removed at this location and it may be possible to revoke the AQMA.



(Fig 2.17)



(Fig 2.18)

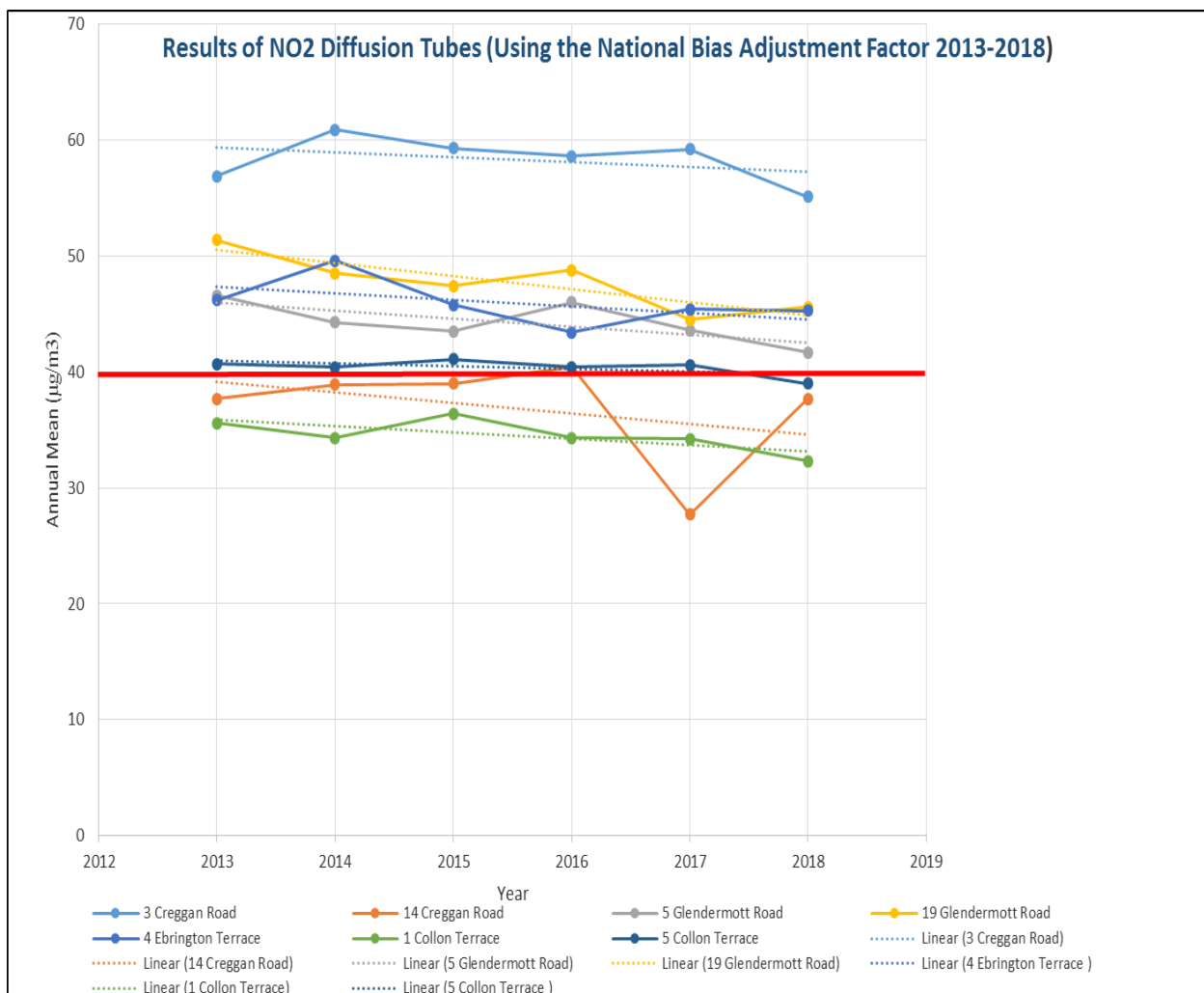


(Fig 2.19)

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Figure 2.20 shows data collected from the reviewed monitoring sites, using the National Bias Adjustment Factor for 2013-2018. There is minimal difference between the local and national factors and the graph below shows the worst case for illustration purposes.

All sites show downward trends. 14 Creggan Road and 1 Collon Terrace have been consistently below the annual mean NO₂ limit value of 40µg/m³. 5 Collon Terrace is shown to be just above the annual mean objective but dropping below in 2018. 3 Creggan Road, 4 Ebrington Terrace and 19 Glendermott Road have been recorded consistently higher than the annual mean objective of 40µg/m³. 3 Creggan Road has historically shown the highest concentrations but the downward trends are encouraging.



(Fig 2.20)

2.2.2 Particulate Matter (PM₁₀)

The Council monitors PM₁₀ at three locations in the district;

- Derry AURN Rosemount
- Springhill Park, Strabane.
- Strathfoyle

The monitoring data is summarised in Table 2.7 for PM₁₀ Annual Mean Concentrations in comparison to its Objective and in Table 2.8 for the 24-hour Mean number of exceedances. Concentrations for Springhill and Strathfoyle have been automatically adjusted by AQDM to gravimetric equivalent using the VCM methodology.

Figure 2.21 shows the trends in annual mean PM₁₀ concentrations at all sites.

Concentrations at Springhill Park show a general downwards trend although concentrations have remained similar 2017 and 2018. There are limited results from Derry Rosemount site due to it only being operational from mid-2016. There is limited data for Strathfoyle due to it only being operational from mid 2018.

All sites were found to be below the annual mean objective for 2018, whereas the Springhill Park monitoring site has been below the annual mean objective in all years (2013-2018). PM₁₀ concentrations had fallen to 15ug/m³ in 2017 and 2018 at the Springhill Park monitoring site and remained the same in 2018.

There was 1 exceedance of the 24-hour Mean concentration at Rosemount and none at the Springhill Park site in 2018.

Table 2.7 – Results of Automatic Monitoring for PM₁₀: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period % ^a	Valid Data Capture 2018 % ^b	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration µg/m ³				
						2014* ^c	2015* ^c	2016* ^c	2017 ^c	2018 ^c
Derry Rosemount	Urban background	N	95%	95%*	Y	-	-	-	11	12
Springhill Park, Strabane	Urban background	Y	86%	86%	Y	17	18	18	15	15
Bawnmore Place Strathfoyle	Suburban	N	38%	91%	Y	N/A	N/A	N/A	N/A	15

In bold, exceedance of the PM₁₀ annual mean AQS objective of 40µg/m³

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

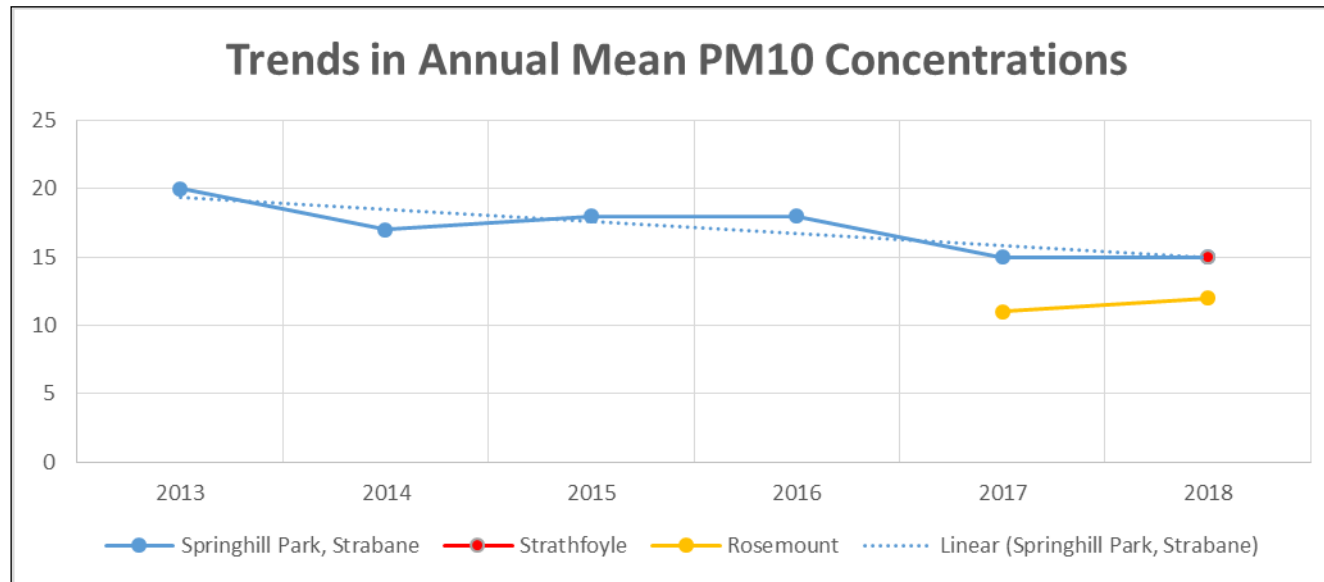
^b i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

^c Means should be “annualised” as in Boxes 7.9 and 7.10 of LAQM.TG16, if valid data capture is less than 75%

Note: this was not undertaken for Strathfoyle as the recorded concentration is substantially below the limit value and is not a DEFRA or affiliated site. The next LAQM report will have full year data for 2019.

* Annual mean concentrations for previous years are optional

Trends in Annual Mean PM₁₀ Concentrations



(Fig 2.21)

Table 2.8 – Results of Automatic Monitoring for PM₁₀: Comparison with 24-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period % ^a	Valid Data Capture 2018 % ^b	Confirm Gravimetric Equivalent	Number of Exceedances of 24-Hour Mean (50 µg/m ³)				
						2014* ^c	2015* ^c	2016* ^c	2017 ^c	2018 ^c
Derry Rosemount	Urban Background	N	95%	95%	Y	-	-	4	1	1
Springhill road, Strabane	Urban Background	Y	86%	86%	Y	2	0	3	2	0
Bawnmore Place Strathfoyle	Suburban	N	38%	91%	Y	N/A	N/A	N/A	N/A	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 data capture is less than 85%, include the 90.4th percentile of 24-hour means in brackets

* Optional

In bold, exceedance of the PM₁₀ daily mean AQS objective (50µg/m³ – not to be exceeded more than 35 times per year)

2.2.3 Sulphur Dioxide (SO₂)

The monitoring data are shown in Table 2.9. There were no exceedances of any of the objectives at either site in 2018.

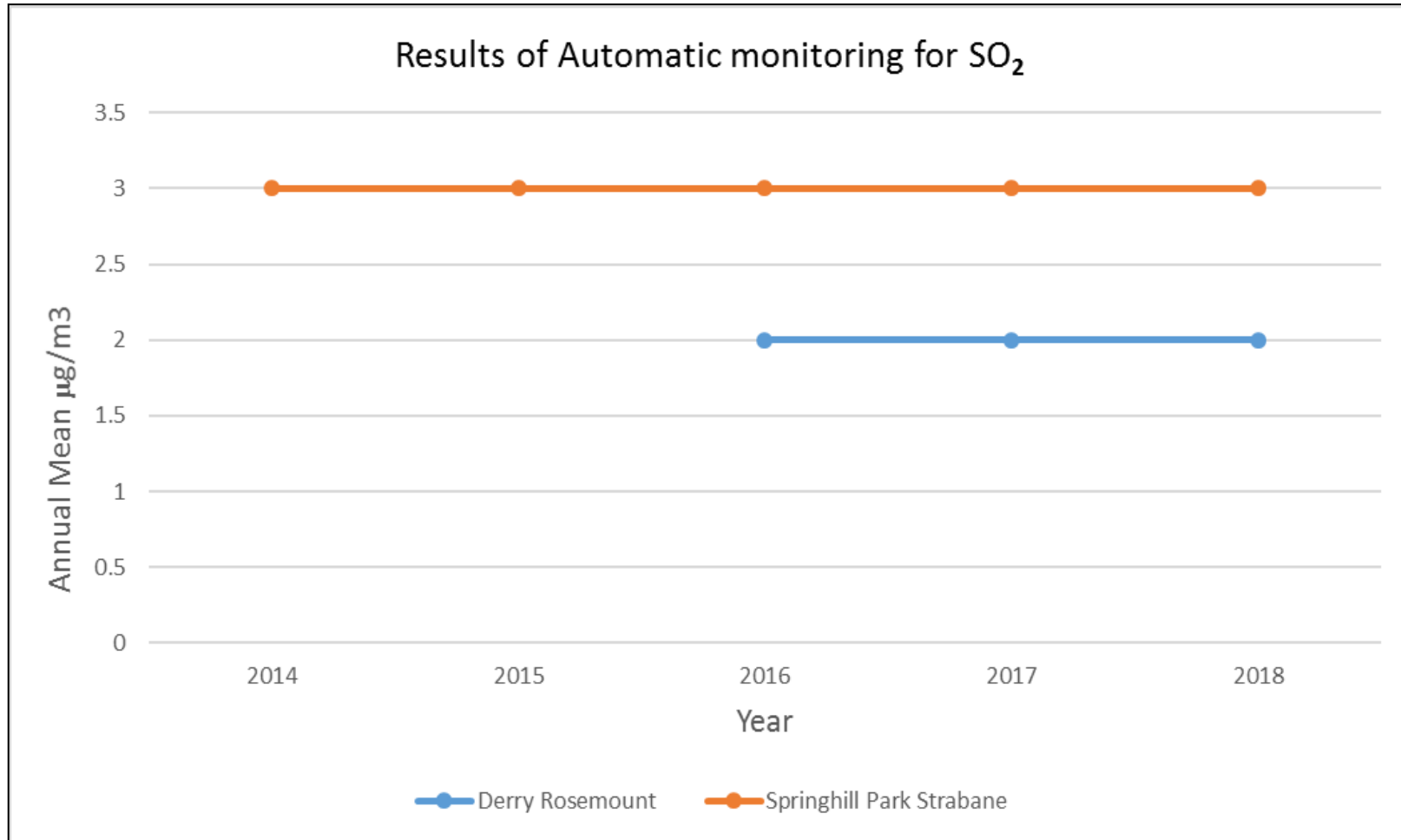
Table 2.9 - Results of Automatic Monitoring for Sulphur: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period % ^a	Valid Data Capture 2018 % ^b	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration µg/m ³				
						2014* ^c	2015* ^c	2016* ^c	2017 ^c	2018 ^c
Derry Rosemount	Urban background	N	97%	97%	Y	-	-	2	2	2
Springhill Park, Strabane	Urban background	Y	99%	99%	Y	3	3	3	3	3

Table 2.10 – Results of Automatic Monitoring for SO₂: Comparison with Objectives

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period % ^a	Valid Data Capture 2018 % ^b	Number of Exceedances (percentile in bracket µg/m ³) ^c		
					15-minute Objective (266 µg/m ³)	1-hour Objective (350 µg/m ³)	24-hour Objective (125 µg/m ³)
Derry Rosemount	Urban Background	N	97%	97%	0	0	0
Springhill Road, Strabane	Urban Background	Y	99%	99%	0	0	0

Figure 2.22 - Graph showing Results of Automatic Monitoring for SO₂.



(Fig 2.22)

2.2.4 Benzene

No benzene monitoring takes place within Derry City and Strabane District Council area.

2.2.5 Other pollutants monitored

PM_{2.5}

PM_{2.5} is measured at the Derry Rosemount site. PM_{2.5} objectives have been set out in the UK Air Quality Regulations, although, there is no requirement for local authorities to review and assess PM_{2.5} against these objectives as part of the LAQM regime. Results have been reported as recommended by Technical Guidance LAQM.TG16, shown in Table 2.10.

Table 2.11 Results of Automatic Monitoring of PM_{2.5}: Comparison with Annual Mean Objectives

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %	Valid Data Capture 2018 %	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration $\mu\text{g}/\text{m}^3$				
						2014	2015	2016	2017	2018
Derry Rosemount	Urban background	N	96%	96%	Y	-	-	-	8	10

Ozone (O3)

Ozone is measured at the Derry Rosemount site. O3 is a transboundary pollutant; the sources of O3 are frequently spatially distant from the measured site of the concentrations. This pollutant is not a prescribed air quality objective for LAQM purposes; however, it has been reported as recommended by Technical Guidance LAQM.TG16.

The monitoring data are shown in Table 2.12. There were no exceedances of 8-Hour Running Mean in 2017/ 2018.

Table 2.12 Results of Automatic Monitoring of Ozone: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period % ^a	Valid Data Capture 2018 % ^b	Confirm Gravimetric Equivalent (Y or NA)	Number of exceedances of 8-Hour Running Mean (100 µg/m ³)				
						2014	2015	2016	2017	2018
Derry Rosemount	Urban background	N	97%	97%	Y	-	-	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%).

Polycyclic Aromatic Hydrocarbons (PAH)

As part of the UK network, PAH is measured on behalf of DEFRA/DAERA at the Derry Brandywell site. Exceedences of the target value of 1 nanogram/m³ for the annual mean concentration of B[a]P have been measured in 2010 and 2016. Full results can be found

at: https://uk-air.defra.gov.uk/data/non-auto-data?uka_id=UKA00499&network=paha&s=View+Site

2.2.6 Summary of Compliance with AQS Objectives

The Council has examined the results from monitoring in the district. There were no exceedances of any objectives outside the existing AQMA boundaries, or within the Spencer Road AQMA. In 2018, DCSDC revoked the Strabane, Newtownstewart and Castledearg AQMA's for particulates (PM10). The former SDC Action Plan measures were realised and pollution levels reduced to well below health limit values. The Smoke Control Areas still remain. The Strand Road AQMA for nitrogen dioxide was revoked in 2018 and the Spencer Road AQMA was reduced in size to reflect updated monitoring and modelling results. It is recommended that the Spencer Road AQMA be revoked due to continually reduced NO₂ concentrations. The remaining AQMAs are considered appropriate for the time-being.

3 New Local Developments

3.1 Road Traffic Sources

The following road traffic sources which may have an impact on air quality have been considered since the last Progress Report: The Council confirms that as there has been no significant change to any of the above-mentioned sources since the 2017 Progress Report, there is no need to proceed to a Detailed Assessment.

Narrow congested streets with residential properties close to the kerb

Busy streets where people may spend 1-hour or more close to traffic

Busy streets where people may spend 1-hour or more close to traffic were considered in previous assessments.

Roads with a high flow of buses and/or HGVs

Roads with a high flow of buses and/or HGVs were considered in previous assessments.

Junctions

Relevant junctions were considered in previous assessments.

New Roads constructed or proposed since the last round of review and assessment

No new roads have been identified that were not previously considered.

Roads with significantly changed traffic flows

No roads with significantly changed traffic flows have been identified.

Bus and Coach Stations

These were considered in previous assessments.

3.2 Other Transport Sources

Airports

Airports were considered in previous assessments.

Locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m

Stationary and moving trains were considered in previous assessments. The Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

Ports for shipping

Ports and shipping were considered in previous assessments.

3.3 Industrial Sources

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

No new installations have been identified. The 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.

Existing Installations where Emissions have increased substantially or New Relevant Exposure has been introduced.

No relevant installations have been identified. The 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.

New or significantly changed installations with no previous Air Quality Assessment

All installations were considered in previous assessments.

Major Fuel (Petrol) Storage Depots

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Major fuel storage depots were considered in previous assessments.

Petrol Stations

Petrol stations were considered in previous assessments. The Council confirms that there are no petrol stations meeting the specified criteria.

Poultry Farms

No relevant poultry farms have been identified. The Council confirms that there are no poultry farms meeting the specified criteria.

3.4 Commercial and Domestic Sources

Biomass Combustion – Individual Installations

Biomass combustion was considered in previous assessments.

Areas where the combined impact of several biomass combustion sources may be relevant

Biomass combustion was considered in previous assessments.

Areas where domestic solid fuel burning may be relevant

Domestic solid-fuel burning was considered in previous assessments. In addition, a Fuel Use Survey was commissioned by Council and a report produced in March 2019. 10% of properties were surveyed within each of 20 designated 1km X 1km geographical areas (approx. sample total of 2760 properties) across the Council area, with a response rate of at least 75%, totalling 2077 surveys. The main types of fuel used were Oil (73.62%), followed by Gas (22.81%) , Coal/solid fuel (2%), Electricity (1.35%), wood (0.14%) and other (0.09%). The survey confirmed the very low incidence of burning of domestic solid fuel, particularly wood.

The Council confirms that there are no areas of significant solid domestic fuel use in the Local Authority area.

Combined Heat and Power (CHP) Plant

The Council confirms that there are no installations meeting the specified criteria that require a Detailed Assessment.

The Council confirms that the above installations are considered as a part of the council's planning process. Where necessary, an Air Quality Assessment is requested to demonstrate that the proposal will not lead to exceedance of any relevant pollutants and impact on localised air quality or relevant receptors. Further information on planning applications, which required an Air Quality Assessment, is provided in Section 5 of this report.

3.5 New Developments with Fugitive or Uncontrolled Sources

Fugitive or Uncontrolled Sources

The following new developments with fugitive or uncontrolled sources may have an impact on air quality:

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

Fugitive sources were considered in previous assessments. There were a number of applications for quarries/ extensions to quarries in the Council district where the potential existed for PM₁₀ emissions to affect nearby dwellings. The quarries were screened in accordance with Table 7.5 – Screening Assessment of Fugitive or Uncontrolled Sources of the Technical Guidance LAQM.TG16.

The Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area other than quarries which were considered in a previous assessment.

4 Local / Regional Air Quality Strategy

The Council notes the publication by the Department for Environment Food and Rural Affairs of the “Clean Air Strategy 2019” which refers to Northern Ireland in section 9.5. This section refers to a specific Air Quality Strategy for Northern Ireland that is in preparation. Derry City and Strabane District Council awaits the publication of this strategy that would inform Council on future approaches to Local Air Quality Management.

5 Planning Applications

The Council considers all planning applications that are submitted in the district. If any proposed development has the potential to adversely affect air quality in relation to the relevant public exposure criteria, as described in the most recent Technical Guidance LAQM.TG16, the developer is requested to submit an air quality assessment.

Further to the proposed developments with potential air quality issues that were considered in the previous USA report, the following approved developments have the potential to adversely affect air quality:

A5 Dual Carriageway Scheme: Public Inquiry 2020

Council responded in previous reports to the application for the above scheme. Council also subsequently made representations to the Department of Infrastructure on information provided within the Environmental Statement Addendum (2019) in relation to, among other issues, air quality associated with the new dual carriageway. Council confirmed it is content that all impacts, in relation to Air Quality on any nearby receptors with relevant exposure, have been appropriately assessed and there are no projected exceedences of any of the pollutants of concern.

Planning Application Reference no. LA11/2017/0623/F.

Proposal: 8 No. 3 person / 2 Bedroom Semi Detached General Needs Houses 2 No. 5 person / 3 Bedroom Semi Detached General Needs Houses 2 No. 5 person / 3 Bedroom Semi Detached Complex Needs Houses Total: 12 No. Houses on Lands to the North of Ferndale Road and Adjacent to Skeoge Business Park Derry/Londonderry.

The proposed development is close to the Skeoge Link dual carriageway. Regarding the operational impact of the Proposed Development on the surrounding area, detailed atmospheric dispersion modelling was undertaken for the first year in which the development is expected to be fully operational, 2021. The operational impact of the Proposed Development on existing receptors in the local area is predicted to be

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'negligible' taking into account the changes in pollutant concentrations and absolute levels. Using the criteria adopted for this assessment together with professional judgement, the overall impact on the area as a whole is described as 'negligible'. Regarding suitability of air quality at the site for introducing new occupants, pollutant concentrations at the façades of proposed residential receptors are predicted to be within the relevant health-based air quality objectives. On that basis, future occupants of the Proposed Development will be exposed to acceptable air quality and the site is deemed suitable for its proposed future use in this respect.

Planning Application Reference: LA11/2019/0473/DC

Proposal: Discharge of Condition No 14 of planning approval LA11/2018/0841/RM, for submission of Air Quality Impact Assessment at Vacant lands at Galliagh South of Skeoge Link North of Lower Galliagh Road and Woodbrook West of no 14 Lower Galliagh Road

Council had concerns that, due to the proximity of some of the proposed dwellings to traffic sources on the Skeoge dual carriageway, that pollutant concentration might have a negative effect on the future health of these residents.

The DMRB Screening Model was used for the assessment with pollutant predictions made for future year 2021 when the development would be completed.

For Nitrogen Dioxide (NO₂), the predicted annual mean value with the development was 11.24ugm⁻³ compared to a Limit Value of 40ugm⁻³. For Particulate Matter (PM₁₀), the predicted annual mean value with the development was 8.98ugm⁻³ compared to a Limit Value of 40ugm⁻³. The daily mean of 50ugm⁻³ is not predicted to be exceeded on any occasion at this location.

Based on the results of the Air Quality Impact Assessment, Council is satisfied that the development will not have an adverse impact on air quality in the vicinity of the site nor be adversely affected by traffic pollutants from the Skeoge dual carriageway.

Proposal: residential development of 380No. dwellings comprising a mix of 64No. detached; 280No. semi-detached and 36No. apartments at Lands accessed from Fincairn Road and Glenshane Road, directly east of Copperthorpe housing development, Drumahoe, Co. Londonderry.

An air quality assessment was undertaken using the Highways Agency's DMRB methodology to consider the potential effects of the proposed development on air quality during both the construction and operational phases. This included baseline information including existing Air Quality Management Areas (AQMA's).

A base year of 2017 and opening year of 2019 with the proposed development was adopted. Relevant public exposure at specific sensitive receptors was identified and NO₂ and PM₁₀ concentrations determined at these sensitive receptors to determine the effects on local air quality due to changes in road traffic emissions associated with the additional development traffic.

The assessment concluded that the impact on air quality is expected to be negligible at all receptors and that, as concentrations at the receptors would be below the relevant air quality criteria, any effect would not be significant so that no mitigation is required and the site is considered suitable for the proposed development.

It was stated in the report that the proposed development is not expected to affect any AQMAs in the district. The nearest AQMA is at Dale's Corner, approximately 3.5km away. Council requested additional information, further to the report submitted as part of the previous Environmental Statement submitted in support of Phase 1 adjacent the current proposals, to assess the impact of traffic from Phase 1 on this AQMA. It was found that the effects from the additional traffic were negligible. Council would concur that the additional traffic from the current proposals should not affect the Dale's Corner AQMA.

Council would concur with the conclusions of the report that, as concentrations at the chosen relevant receptors, one within the proposed development and six outside

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close to major and minor roads, would be below the relevant air quality criteria, any effect would not be significant.

Council strongly recommended that consideration should be given, as suggested in the report, to the application of good design and good practice measures for example, cycle parking provisions, encouraging the uptake of sustainable modes of transport and also a Travel to Work Plan to be prepared which seeks to reduce vehicle trips made by construction workers.

Planning Reference no. LA11/2019/0473/DC.

Proposal: Discharge of Condition No 14 of planning approval LA11/2018/0841/RM- Air Quality Impact Assessment required for housing development on vacant lands at Galliagh South of Skeoge Link North of Lower Galliagh Road.

Council considered the Air Quality Impact Assessment by AONA Environmental Consulting Ltd. Council had concerns that, due to the proximity of some of the proposed dwellings to traffic sources on the Skeoge dual carriageway, that pollutant concentration might have a negative effect on the future health of these residents.

The DMRB Screening Model was used for the assessment. The most sensitive receptor, the one closest to the approach to the roundabout where traffic would be slowing down, was chosen and pollutant predictions were made at this location for future year 2021 when the development is deemed to be completed. Appropriate Annual Average Daily Traffic (AADT) flows, including the existing traffic on the Skeoge dual carriageway and the traffic contribution from the proposed development, were also used in the assessment. DEFRA background pollutant concentrations were used.

For Nitrogen Dioxide (NO₂), the predicted annual mean value with the development was 11.24ugm⁻³ compared to a Limit Value of 40ugm⁻³. For Particulate Matter (PM₁₀), the predicted annual mean value with the development was 8.98ugm⁻³ compared to a Limit Value of 40ugm⁻³. The daily mean of 50ugm⁻³ was not predicted to be exceeded on any occasion at this location.

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The report concludes that the development will not have an adverse impact on air quality in the vicinity of the site and there will be no significant air quality impact on future residents in the proposed residential development.

Based on the results of the Air Quality Impact Assessment, Council is satisfied that the development will not have an adverse impact on air quality in the vicinity of the site nor be adversely affected by traffic pollutants from the Skeoge dual carriageway.

Planning Reference no.: A/2014/0629/F.

Proposal: mixed use regeneration of the Arntz Belting Co. Ltd and Eurocentre West site to provide 4 no retail warehouses (totalling 4.459 gross sq m) Medical Building, Superstore (totalling 6503 gross sq m) Educational Research & Development Building, Restaurant, Self Service Filling Station at Pennyburn Pass and former Eurocentre West site, Pennyburn Industrial Estate Road.

An air quality assessment (Chapter 12 of the Environmental Impact Assessment) used a computer model to predict changes in air quality as a result of the introduction of the proposed development. The assessment concluded that the air quality objectives for NO₂ and PM₁₀ as stipulated within 'The Air Quality Standards Regulations (Northern Ireland) 2010' shall be met.

Amended layout details were also submitted: it was felt that the revised proposals for the site will result in less vehicle/heavy goods vehicle movements and consequently have less impact on air quality than the previous design layout.

Planning Reference no. LA11/2017/0301/F.

Proposal: Refurbishment of existing Grade B Listed Former Railway Station to provide accommodation for an Active Transport Hub for Translink including Passenger Facilities, Café, Retail Space, Staff Facilities and Office Accommodation.

An Air Quality Impact Assessment (AQIA) was submitted. The applicant advised there will be no increase in bus traffic passing through the AQMA at 'Dales Corner'.

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The AQIA report compared air quality pollutant concentrations with and without the proposed development against the Environmental Protection UK and Institute of Air Quality Management guidance “Land-Use Planning & Development Control: Planning for Air Quality” May 2015.

The background concentrations employed within the ADMS modelling in the report were taken from the UK National Air Quality Information Archive database published Background Air Quality Levels as, it is suggested, these better represent the urban background in proximity to the proposed development.

The nearest sensitive receptors considered as part of the air quality impact assessment are the residents of dwellings that are located closest to the road network surrounding the proposed development at Bonds Hill, Simpsons Brae, Dorman Court and Harpers Quay Apartments. The report relied upon 2018 AADT flows (assumed year of opening of the proposed development), without and with the proposed development in operation. The predicted air quality pollutant concentration results were compared with the Air Quality Limit Value Regs (NI) 2010.

Council agreed with the methodology used in this air quality modelling assessment. The report acknowledged the use of the UK National pollutant background data, as opposed to DCSDC local continuous background pollutant data, as better representation of the urban background in proximity to the proposed development. Council indicated that, although the local data gives higher concentrations for NO₂ and PM₁₀, the predicted pollutant levels for 2018 with the development in place fall substantially short of limit values and so the background levels in this instance are not of prime importance.

The report concluded that, based on the results of the ADMS Roads Assessment, it was predicted that the annual mean PM₁₀, PM_{2.5}, NO_x and NO₂ limit values will not be exceeded at the dwellings in the vicinity of the proposed development and that there will be an insignificant impact on the air quality in the vicinity of the development. Council concurred with the findings of the report that there will not be a significant impact on air quality in the vicinity of the development.

Planning Reference no. LA11/2016/0422/O.

Proposal: New residential neighbourhood, local centre (including convenience retail and professional and retail services) at Clooney Road, (to the West), Crescent Link (to the South West) and Rosstown Road (to the East).

Section 13 of the submitted 2016 Environmental Statement (ES) addressed the potential for emissions from additional traffic associated with the development to affect air quality at existing sensitive receptors near affected roads, including the AQMA at Dale's Corner, as well as at new sensitive receptors within the site boundary.

A total of 27 receptors were included in the DMRB screening model, appropriate background concentrations for NO₂ and PM₁₀ were used and a sensitivity test, assuming 2013 background concentrations in the 2017 opening year (now lapsed) scenario, was also carried out to provide a more robust assessment. Appropriate traffic volumes and speeds were used as model inputs.

Committed developments, relevant to the assessment of air quality at the proposed development site, were also accounted for in the future baseline as they are considered to contribute to additional road traffic in the vicinity of the application site. These include seven major housing, commercial and educational schemes in the vicinity.

Modelled concentrations at all receptors were combined with background concentrations and compared with relevant air quality criteria to determine if exceedances are likely.

Modelled total concentrations and changes in concentrations of annual mean NO₂ and PM₁₀ for all receptors were estimated to be below the criterion of 40 µg/m³ in the base year and both without and with the proposed development in its opening year. The report stated that the effect at all receptors was not considered to be significant as concentrations were below the air quality criteria. Furthermore, as the

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annual mean NO₂ concentrations were all estimated to be less than 60 µg/m³, the hourly mean criterion is unlikely to be exceeded.

Verification of the air quality model was undertaken and no adjustment to results was found necessary. The report did note that the model was underestimating at the monitoring sites within the Dales Corner Air Quality Management Area (AQMA), possibly indicating that results at those receptors within the AQMA (R9 and R13) could also be underestimated.

Section 13 of the ES concluded that, even at its highest yield scenario, the proposed development, is not likely to have a significant effect on local air quality at existing receptors and that the introduction of new sensitive receptors associated with the proposed development is unlikely to result in exposure to pollutant concentrations in excess of relevant AQS objective and EU limit values.

The report advised however that, given the concern of a possible underestimate of modelled concentrations at receptors within the Dales Corner AQMA, the assessment should be repeated using detailed modelling.

Section 13 of the ES advised that consideration should be given to the application of good design and good practice measures for example, cycle parking provisions encouraging the uptake of sustainable modes of transport. In addition, a Travel to Work Plan is to be prepared seeking to reduce vehicle trips made by construction workers. The Travel to Work Plan for the proposed development should aim to keep the numbers of additional vehicle movements generated by the development to a minimum, for example by encouraging the use of sustainable means of transport. Council fully commended the above measures to help reduce pollution levels in the city.

A subsequent air quality report was recently submitted for Phase 1 of 2 for this development. This provided similar conclusions to the 2016 ES and the developer is now to undertake more detailed dispersion modelling using ADMS.

Planning Reference no. LA11/2010/0030/F.

Proposal: Site between Temple Road and Maydown Road, Lisahally opposite location of former dwelling 38 Temple Road - 15MW dedicated biomass (virgin wood fuelled) combined heat and power plant

The applicant provided an Air Quality Impact Assessment in which an AERMOD atmospheric dispersion model was used to predict potential ground level concentrations of gaseous pollutants at receptors in the vicinity of the proposed development. The report predicted environmental concentrations of CO, NO₂, NO_x, PM₁₀ and SO₂ and compared them against 'Limit values' from The Air Quality Standards Regulations (Northern Ireland) 2007. The report concluded that pollutant levels all fell significantly below the relevant standards.

6 Air Quality Planning Policies

The Council is currently in the process of developing its Local Development Plan (LDP) 2032. When adopted the Council's LDP will replace the current Derry Area Plan 2011 (adopted May 2000) and the Strabane Area Plan 2001 (adopted 1991). The new LDP will replace most existing regional policies. The LDP will consist of two development plan documents:

- The Plan Strategy (PS); and
- The Local Policies Plan (LPP).

A draft Plan Strategy has been published and has been the subject of external consultation between 2nd December 2019 and 27th January 2020.

The LDP is to take account of the Councils overall vision for the District set out in our Community Plan – the Inclusive Growth Plan for Derry City and Strabane District Council (2017) which has as its Vision for the District:

“To make Derry City and Strabane District a thriving, prosperous and sustainable development, whilst protecting our environment, and also promoting well-being with equality of opportunity for all.”

The draft LDP sets out a number of objectives including putting in place the Councils Planning framework of policies that will deliver high quality sustainable development across the City and District to 2032, contributing to climate change prevention/adaptation, protecting the environment and meeting the needs (including health and well-being and amenity) of residents and visitors.

General Development Principles have been stated within the draft LDP to achieve sustainable development (GDP1), tackle climate change (GDP 2) and improve health and wellbeing (GDP3) by promoting active travel, limiting emissions and ensuring development proposals do not significantly impact on air quality.

The General Development Principles outlined above will be delivered through the policies contained in the LDP and the application of best practice guidance.

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General Development Management Policy (GDPOL 1) is one of a number of essential criteria that must be met by all developments and indicates that planning permission will be granted where there is no significant impact on amenity as a result of air pollution. In justifying this policy, the LDP recognises the impact on health of poor air quality, current Air Quality Management Areas, Smoke Control Areas and the forthcoming Air Quality Strategy for Northern Ireland. The need to sustainably manage and improve air quality is recognised as an important objective. In addition to the Air Quality Strategy for Northern Ireland, the LDP is one of the more effective mechanisms to be utilised to improve air quality. This includes taking into account existing and future air quality in an area and having regard to any local Air Quality Management Areas.

The Council is currently developing a Climate Change Adaptation Plan and is considering further supplementary best practice guidance on air quality. The Institute of Air Quality Management (IAQM) have produced their 2017 guidance document entitled, 'Land-Use Planning & Development Control: Planning For Air Quality'. The Council's Environment and Neighbourhoods Team refers to this document in order to determine when an Air Quality Impact Assessment is required.

7 Local Transport Plans and Strategies

North West Transport Plan – Draft Local Transport Study (November 2019)

A draft North West Transport Plan (NWTP) is being developed to support the achievement of the objectives set out in Draft Programme for Government (PfG)/ Outcomes Delivery Plan, the Regional Development Strategy 2035 – Building a Better Future, Ensuring a Sustainable Transport Future: A New Approach to Regional Transportation and Northern Ireland Changing Gear – A Bicycle Strategy for Northern Ireland and also the objectives of the Council’s Development Plan Documents and Community Plans.

The Department for Infrastructure (DfI) has undertaken a Transport Study of the North West area focused on the Derry City and Strabane District Council (DCSDC) area. The purpose of the Transport Study is to set out an objective evidence-based assessment of current and future transport issues in the context of the Council’s growth ambitions. The transport measures identified are in line with the Draft Programme for Government of the NI Executive, current government policies and with the direction of the Council’s Strategic Growth Plan and shared so that it could inform the Council’s Local Development Plan (LDP) – Draft Plan Strategy stage.

A review of policy context identified seven transport objectives for the development and assessment of transport options in the Study Area and included:

Objective 3 Improving active travel accessibility and

Objective 6 Improving public safety including air quality.

The draft Study has proposed a number of indicative transport measures that should be considered in further detail a number of which will assist in improving air quality

across the council area. The following transport measures that should be considered as detailed in the draft study are as follows:

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1. Improved inter-urban roads on Key Transport Corridors
2. Improved 'limited-stop' bus services to key hubs
3. Rail service improvements to and from Coleraine, Belfast and Dublin
4. Park & Ride and Park & Share at strategic locations
5. Integration of passenger transport services including innovative transport models such as 'ride-share'
6. Improvements to Foyle Metro with flagship high quality cross-city route
7. New urban road links and supporting sustainable transport infrastructure to facilitate key development funded by developer
8. Derry and Strabane Parking Strategies including integrated management of long and short-stay spaces
9. Provision of improved walking facilities in urban areas
10. Provision of a network of attractive radial cycling routes in Derry and Strabane with greenways between towns
11. Traffic management schemes in urban areas to re-balance modal hierarchy with priority given to pedestrians, cyclists and public transport in Derry and Strabane centres
12. Transport infrastructure to be designed, provided and maintained to 'best practice' standards to maximise operational performance and safety at all times
13. Ensure that user behaviour regarding safe use of the transport network is monitored and addressed.

As indicated, the study is currently in draft format and is subject to change but provides the basis for the development of a future transport plan for the council area.

8 Climate Change Strategies

Air Quality and Climate Change

Air quality and climate change are fundamentally interrelated. Many common air pollutants are 'climate active', and reducing emissions will lessen the warming effect on our climate. A warming climate also threatens to make air quality worse, with the prevalence of harmful photochemical smog's likely to increase throughout longer, hotter summers.

Response to the challenge of climate change can be defined as mitigation (measures to reduce emissions) and adaptation (actions to adapt and deliver resilience).

The UK Government has set a legal target for the UK to reach net zero carbon emissions by 2050. The following section outlines the initiatives currently being delivered by Council to address the issue of climate change.

In Northern Ireland, it is not currently a statutory requirement for local authorities to undertake adaptation planning, however The Council is leading the way with the CLIMATE (Collaborative Learning Initiative Managing and Adapting to the Environment) Programme.

Council recently passed a motion to establish an all-party working group to address the issue of climate change. The initial focus being development of a climate pledge outlining Council's commitment to mitigation and adaptation.

Adaptation Planning

The Council is currently leading the way across Northern Ireland in relation to climate action planning. The Council will be first local authority in NI to develop a 'climate adaptation plan'.

A dedicated working group and task force are currently in place and taking forward the development and delivery of the adaptation plan. The scope of the initial 5-year plan includes preparedness and resilience of Council services, operations, estate, businesses and communities and is due for completion in early 2020.

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The adaptation planning process followed by DCSDC has been developed into a model and toolkit to be shared across all NI councils to assist in the delivery of their respective climate adaptation plans. Climate Northern Ireland will support the council adaptation planning process.

The following draft actions relating to air quality and environmental health have been identified within the Climate Adaptation Plan:

- Continue air quality awareness campaigns
- Undertake further analysis of air quality throughout the city and district to understand impact of climate change and areas / locations of high vulnerability
- Continue the 'Life Tree Project' planting programme where trees are planted for all births, deaths and marriages in the district and create several woodlands, to address air quality issues
- Include Climate Change Safety Fact Sheet in Birth Registration Pack

In addition a significant number of actions have been identified to further develop green infrastructure across the city and district including increased tree and vegetation coverage to improve air quality.

DCSDC Green Infrastructure (GI) Plan 2019-2032 (Part 1)

A GI stakeholder group was set up by DCSDC in September 2017 to develop a Green Infrastructure Framework (DCSDC, 2018a) to develop a holistic approach for a planned, high quality, well connected and multi-functional GI network; which provides a range of benefits for residents and the environment. One of the four key strategic themes of this plan is climate change. The Green Infrastructure Plan 2019-2032 (Part 1) is to be followed with an associated Action Plan (Part 2) to outline the short medium and long term actions to protect, improve and increase the GI network. This network will connect green spaces (vegetated areas) and blue spaces (waterways) and increase tree and vegetation coverage to improve air quality. The GI plan covers the Council area plus a 20km buffer around the district to capture cross boundary opportunities.

If strategically designed with the right vegetation in the right place GI can offer considerable health benefits in terms of public health on air pollution by altering the amount of emissions that people are exposed to. Vegetation at smaller scales (street

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level) can be used to control the flow/distribution of pollutants by controlling their dispersion. Woodlands, plants, grasslands and other vegetation remove significant quantities of air pollutants.

Council hosted the first Green Infrastructure and Climate Change conference for Northern Ireland on the 12th March 2019. This brought together national and international practitioners and experts to raise awareness of the issues and share best practice approaches and solutions. Regional engagement is ongoing through networks such as Sustainable NI, Regional Community Resilience Groups, Regional Coastal Forum, Sustainable Travel Forum, Storm Water Management Group and collaboration with universities and other local authorities.

North West Greenway Project

In 2015 the Council, in partnership with Transport NI (TNI), Donegal County Council (DCC) and Sustrans NI, formally established the Active & Sustainable Travel Forum (ASTF). The partnership's strategic vision is set within the context of the North West Greenway Action Plan: *“To develop a cross border network of greenways that link people with places locally, regionally and nationally- bringing social, economic & environmental wellbeing to all.”*

In December 2016 DCSDC, DCC, the Department for Infrastructure (NI) and Sustrans (the UK-based cycling and walking charity), were awarded €14.8 million funding from the EU's INTERREG VA programme, administered by the Special EU Programmes Body (SEUPB), to construct 46.5kms of cross-border greenway. Match-funding has been provided by the Department for Infrastructure in Northern Ireland and the Department of Transport, Tourism and Sport in Ireland. New greenway routes will link Derry to Buncrana via Bridgend; Muff to Derry via Culmore; and Lifford to Strabane. One of the objectives of this 'North West Greenway Project' is to reduce carbon dioxide emissions by over 300 carbon tonnes per year by 2023.

Council Energy Team

The Energy Team within Council have now calculated the Council's current carbon emissions and the next stage of this project is to establish how these emissions can be reduced.

Carbon Management Plan

A carbon management plan has been produced the scope of which is the operations and estate of the Council. In 2018 Council combined Greenhouse Gas emissions from heating, vehicle fuel, electricity, transmission losses, water, waste, material usage, business mileage, commuting and business travel were equivalent to **9,784.50 tCO₂e**.

Energy Projects

A number of energy projects are underway within Council, these include:

➤ **SECURE 2016 – 2019**

The Council (DCSDC Northern Ireland, UK) is one of the partners of the SECURE project. During the last 3 years, Council has been working to develop a smarter energy community in Derry and Strabane area. To achieve this objective, it has identified local good energy practices and it has exchanged expertise and knowledge with project partner regions, especially from Nova Scotia in Canada and North Karelia in Finland, but also from Donegal and Leitrim (Ireland), Faroe Islands and Västernorrland (Sweden).

From 2016 to 2019, the Council has achieved a series of outcomes within the project. Among others, Derry and Strabane has:

- implemented a Wattics energy monitoring and targeting system at Foyle Arena, Templemore Sports Complex, City Baths, Civic Offices and the Guildhall and Harbour House;
- installed a 12 kW Solar PV and battery storage in the Irish Street Community Centre's roof, three 5kW 'Sonnen batteries' (an intelligent storage system that adjusts the energy usage) in the community centre's offices and it will soon start a 'fit and tell' study during April 2019; PV installations have also been introduced at a number of other Council facilities.
- upgraded the condensing boiler in Derry's civic offices;
- installed Combined Heat and Power system in Foyle Arena centre;
- Introduction of a Sustainable Transport Enterprise Car Scheme

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- Convert oil heating to more efficient natural gas heating (e.g. Alley Theatre)
- Introduced a Fuel Efficiency Training and Awareness Programme targeted at all sections of Council Fleet Drivers
- Introduced a programme to upgrade outdoor lighting at Recycling and Fleet Depots
- SMARCTIC – A project to integrate smart renewable energy into remote and dispersed areas in Northern and North-West Europe. The project will adopt SMART City techniques, transfer and test them to remote, rural areas to reduce fuel poverty, increase energy security, lower carbon emissions and improve air quality.

The North West Regional Energy Strategy defines a roadmap to achieve a “nett” zero carbon region by 2045

Furthermore, the Council and project partner Donegal County Council (DCC, have been working together in the ‘Regional Strategy Consultancy’ for energy efficiency and it has started the process to get the ISO 50001 Energy Management System accreditation, based on the expertise that DCC shared with them.

➤ **STARDUST SMART Cities & North West Dashboard 2017-2022**

Derry City is signed up as a follower city in the Stardust project which has the objective of providing low carbon, highly efficient, intelligent and citizen orientated cities.

➤ **SMARTrenew 2018-2021**

This project aims to increase awareness off and encourage smarter renewable energy & heating management for rural areas. The primary objective of SMARTrenew is to utilise knowledge transfer from partners across the region to improve efficiency and effectiveness of renewable energy sources and implement innovative and sustainable energy storage solutions.

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Cross Border & North West Region Climate Action
North West Regional Energy Strategy

This is a joint Initiative between Council and Donegal County Council (DCC) funded by the North West Partnership. The strategy will seek to ensure resilience and sustainability of regional energy supplies as well as delivery of renewable energy initiatives on a cross border basis. The project will correlate and analyse the cross border regions energy consumption to include the domestic sector (social/private rental/private owned), commercial and industrial sectors, including road, rail and develop a strategy to reduce combined energy consumption by 20% while balancing the uptake of installed renewable energy with traditional fossil fuels.

Green House Gas Study

A green-house gas study has been commissioned of the North West area in order to establish a baseline of emissions from a range of sources including energy, industry, agriculture and housing. Due for completion 2019.

North West Climate Action Plan

(Development Phase 2019-2022 / Delivery Phase 2022-2032)

Current cross border initiatives will evolve into a wider North West Climate Action Plan. Lead by Council and Donegal County Council (DCC) the NWCAP will deliver transformation change through a strategic framework for climate action on a cross sectoral and regional basis. Focusing on landscape and functionality the NWCAP will deliver collaboration and shared approaches and actions to mitigate and adapt to climate change across the North West. To affirm the region's commitment to addressing the challenges posed, the North West Region will:

“Deliver climate action on a cross sectoral multi agency basis to achieve greater adaptation and resilience to the effects of climate change while leading by example to reduce emissions and mitigate against further global warming.”

As the region shares similar landscapes, climate threats, vulnerabilities and opportunities the NWCAP will ensure consistency of approach through working on a transboundary and collaborative basis.

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It is also recognised that local authorities cannot address climate mitigation and adaptation in isolation, particularly as many issues and areas of vulnerability are beyond the remit of councils, therefore the NWCAP will work on a multi-agency and cross sectoral basis to led and coordinate climate action across the region.

The NWCAP will seek to coordinate and deliver the following on a regional basis:

- Decarbonisation & emission reduction
- Energy efficiency
- Climate resilience and adaptation
- Increased financial savings and economic benefits
- Environmental and social resilience

Local Community Growth Plans

Climate change considerations integrated into community plans within local communities across the city and district.

9 Implementation of Action Plans

In 2008, the Council, along with relevant partner organisations launched its Final Air Quality Action Plan (AQAP) for the city designed to address areas of air quality concern, safeguard good air quality and to achieve national air quality strategy objectives and EU limit values. In 2016 Council declared new AQMA's for NO₂ from traffic sources in the Derry City area and for PM₁₀ from domestic solid fuel burning in Strabane town, Castleberg and Newtownstewart. Although the air quality limit values for particulate matter have now been achieved in Strabane town, Castleberg and Newtownstewart and the AQMA's there revoked in 2018, the limit values for nitrogen dioxide continue to be exceeded and give cause for concern in a few remaining locations.

In order to fulfil our statutory obligations under the provisions of the Environment (Northern Ireland) Order 2002, the council and relevant partner organisations are committed to the development of a revised AQAP for the city to tackle the outstanding nitrogen dioxide (NO₂) pollution issues.

In 2017, Council produced an Air Quality Action Plan Progress Report 2015-2017 that gave an update on progress on the measures in the Action Plan. The Plan draws upon all forms of air quality and transport planning activities, including sustainable transport options as well as engineering solutions. The aim of this AQAP is to improve road vehicle operations and to promote and enable a shift onto more sustainable modes of transport to achieve compliance with the NO₂ annual mean EU limit value.

Table 3 – Action Plan Progress

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Category	No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in AQMA	Progress to Date	Progress in last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
Specific measures to be implemented in Creggan Road AQMA	M1	Restriction of HGV's on Creggan Road plus a 5% reduction in overall traffic at the junction	DfI Roads pass Order restricting >3tonne axle weight vehicles and erect signage at strategic locations (Alternate Routes)	DfI Roads	Completed	Part completed 2013 - signage	Reduce numbers of highly polluting vehicles on Creggan Road. Direct reduction in NO ₂ levels	Reduction of 30% to 35% in NO ₂ annual mean	Regular liaison with DfI Roads DfI Roads to review feasibility of 3T restriction. HGV alternative route signage erected	DfI Roads continuing to review feasibility of 3T restriction.	2020/2021	Access/ deliveries for HGV's will reduce efficiency of the measure. Enforcement of 3T restriction to be revisited as part of review.
	M2	Changed to Attitudinal Survey targeted at 150 households in and around the AQMA	Make residents in and around AQMA aware of alternative-to-car travel options	Derry City and Strabane District Council (DCSDC)	Completed	Completed	Reduce number of vehicles at AQMA. Reduction in NO ₂ levels	As yet unknown	Student undertook survey as part of Master's degree	Completed	Completed	Direct reduction in car usage - Healthier lifestyles. Car-dependency culture barrier to be weakened
Measures Proposed in ITS Short-Term Strategy (S1)	M3	Quality Bus Corridor and Bus Priority Measures	3 no. Cross-city QBC's and bus services via city centre and bus priority at key congestion hot spots	DfI Roads	Completed	Following review by DfI Roads and their consultants measure not feasible	Implementation of QBC's and priority measures – not implemented after review	N/A	Following review by DfI Roads and consultants measure not feasible		1-2 years 5-10 years	Direct reduction in car usage - integrated transport strategy leading to active and sustainable transport. Derry Translink fleet upgraded to Euro 6 (2017)
	M4	Improve Car Parking Management	Continuous city centre Controlled Parking Zone to restrain commuter parking and contribute to modal shift	DCSDC DfI Roads	Ongoing	Not completed	Implementation of CPZ	N/A	Car parking considered as part of development and delivery of a sub-regional integrated transport strategy with implementation plan as part of Council Strategic Community Plan		5-10 years	Small number of controlled parking schemes being reviewed in Derry city centre area. Direct reduction in car usage - Healthier lifestyles. Car-dependency culture barrier to be weakened
To reduce air pollution by department for Infrastructure Travelwise NI Department of Transport in the Republic of Ireland	M5	Establish a Cross Border Travelwise Car Share scheme in the North West that will service the Derry and Donegal areas	DfI Travelwise NI group to target organisations / Employers / stakeholders to assess needs and possibilities	DfI Travelwise NI	Completed	Completed	Direct reduction in car usage	N/A	The CarshareNW car share scheme was discontinued after the end of the two-year pilot scheme	DfI Travelwise NI continues to promote car sharing including highlighting the availability of web-based car sharing sites such as carsharing.ie, Liftshare.com and others	Ongoing	Scheme piloted for Car-dependency culture barrier to be weakened
To reduce air pollution from Derry city Council fleet vehicles	M6	Vehicle emission testing	Assess the feasibility of testing vehicle emissions when routine servicing is carried out / compliance with MOT emissions criteria	DCSDC	Completed	Ongoing	Reduce numbers of highly polluting vehicles on the road.	N/A	Implemented	Implemented	Ongoing	All vehicles undergo annual PSV and emission testing
	M7	Cleaning up Council vehicles	Fitting pollution abatement equipment to older heavy goods vehicles depending on EURO classification	DCSDC	Completed	Ongoing	Reduction in polluting emissions from Council vehicles	N/A	All Refuse Collection Vehicles/large sweepers are now Euro 6 category.		2020	Potential capital costs and maintenance implications
	M8	Promotion of newer cleaner vehicles or alternative fuels where possible	Use of electrically powered vehicles	DCSDC	Completed	Ongoing	Reduction in polluting emissions from Council vehicles	N/A	1 electric van 5 new vehicles purchased through the Enterprise Car Club. Vehicles – 4 hybrid and 1 e-car for use by staff on council duties travelling from Council Offices in Derry and Strabane.		Completed	Reduced emissions from vehicles being used for Council business.
	M9	Vehicle upgrading programme to comply with EURO emission standards	Replacement programme for Council vehicles	DCSDC	Completed	Ongoing	Reduction in pollution / noise	N/A	All Refuse Collection Vehicles/large sweepers are now Euro 6 category		8 vehicles due replacement in	Capital cost of purchasing new

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Category	No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in AQMA	Progress to Date	Progress in last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
							emissions from Council vehicles and increased fuel efficiency.				current financial year	vehicles
		Establish vehicle replacement programme	Programmed replacement of heavy goods vehicles every 7 years	DCSDC	Completed	Ongoing	Reduction in pollution / noise emissions from Council vehicles. Less maintenance for newer vehicles and increased fuel efficiency	N/A	2020 - Euro 4 vehicles - 1 Euro 5 - 36. Euro 6 Vehicles -84		8 vehicles due replacement in current financial year	Capital cost of purchasing new vehicles
	M10	Vehicle Fuel Efficiency	Assess Councils vehicle and mobile plant fuel consumption efficiency and make improvement	DCSDC	Completed	Completed	Better fleet and mobile plant management operations. Increase vehicle and mobile plant fuel use efficiency	N/A	Telemetry and GIS systems monitor vehicle efficiency and route optimisation.		Completed	Increased Council vehicle and mobile plant fuel efficiency.
	M11	Investigate options for better travel planning amongst Derry City and Strabane District Council employees	Encourage walking and cycling among staff and uptake of sustainable modes of transport Completion of Travel to Work Survey	DCSDC & Sustrans	Completed and Ongoing	Completed and Ongoing	Reduced vehicle pollution from staff travelling to / from and at work. Cost savings. Healthier workforce	As yet unknown	5 new vehicles purchased through the Enterprise Car Club. Vehicles .Vehicles – 4 hybrid and 1 e-car for use by staff on council duties travelling from Council Offices in Derry and Strabane. Be Well- Group within Council promotes health and well-being through promotion of walking and cycling among staff. Bike to work scheme (200 employees uptake) Provision of cycling facilities Active Travel Challenge encouraging staff to make more of their journeys by walking, cycling, running, using public transport and lift-sharing.		Completed 2017	Promotes modal shift among staff and overcomes reluctance to give up car and safety concerns. Reduces car journeys. Improves health.
To reduce air pollution from Derry City operations throughout the City	M12	Adopt an environmentally friendly source of power for Council buildings	Power Council buildings with electricity generated from renewable sources	DCSDC	Completed	Completed	Percentage of electricity from renewables	N/A	All Council facilities are supplied by electricity from 100% renewable sources	Council has installed approximately 50Kw of solar panels on the roof of the Alley Theatre Strabane and have plans to install another 50Kw's of solar panels on the roof of the Recycling Centre on Strahan's Road	Complete	Promotion of renewable energy sources for the generation of electricity.
	M13	Employment of a Council Energy Manager	Assessment of Council energy needs and usage. Adopt recommendations made by the Energy Manager to ensure the minimisation of energy consumption and reduction of carbon emissions	DCSDC	Completed	Completed	Reduction in carbon emissions from Council facilities	N/A	13% reduction in CO2 emissions achieved between 2008 and 2010. now 28% by 2016	Implemented	Ongoing	
	M14	Reduce Carbon Dioxide	Manage landfill gas production at Culmore landfill site. Explore the viability of using landfill gas produced at Culmore	DCSDC	Completed	Completed	Offsetting Council power requirements	N/A	Landfill Gas to be used to generate electricity to be used in Council facilities on-site with	Implemented	Complete	Elimination of flaring off of landfill gas from the landfill site

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Category	No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in AQMA	Progress to Date	Progress in last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
			landfill site emissions.						excess electricity sold to NI Water via a private wire arrangement.			
To reduce air pollution through education and community initiatives	M15	Managing bonfire sites	Establish a Council Policy on dealing with bonfires. Educate communities on the types of material that should be burned on bonfires and promote alternatives to bonfires.	DCSDC	Completed 2016/2017	Ongoing	Reduction of pollution from bonfires. Reduction in the number and size of bonfires	N/A	Appointment of officer within Council to specifically engage on bonfire issues	Policy completed and officer appointed 2017	Policy completed and officer appointed	Implementation of bonfire policy to consider alternatives to bonfires , better managed sites resulting in reduced emissions of pollutants from bonfires held in July (1day) and August (2days) .
	M16	Education initiatives, Develop an awareness of environmental issues amongst young people	Education campaign for young people highlighting the health and environmental problems associated with air pollution, via a targeted education programme, which could be delivered online or through schools.eg Step-Up Programme,	DCSDC	Ongoing	Ongoing	Creation of sustainable attitudes to our environment among young people	N/A	Ongoing – develop an education programme for schools and communities		Ongoing	Identify partners and funding opportunities in supporting such initiatives
	M17	Active and Sustainable Travel Initiatives	Derry City and Strabane District Council Active and Sustainable Transport Forum	DCSDC	Ongoing	Ongoing	Reduced peak hour congestion	N/A	Continue working partnerships with Sustrans to ensure that walking cycling initiatives are supported through the Derry City and Strabane District Council Active and Sustainable Transport Forum; Progress made notably in the development of urban greenway network in Council area		Ongoing	Currently 80km of traffic free routes in Council area with a further 47.5km of traffic free greenways to be completed by the end of 2021 through cross border EU funding
	M18	Cycling Initiatives	Promote cycling among staff. Encourage Derry City and Strabane District Council employees to consider the use of bicycles in their daily duties.	DCSDC	Ongoing		Health benefits. Reduced pollution from non-use of vehicles	N/A	Council promotes cycle to work scheme once a year among staff		Scheme for 50 members to progress in summer 2012 Up to 2017 scheme utilised by 200 staff	Promotes modal shift among staff reducing car journeys a
	M19	Improve information provision via electronic methods	Provide the public with air quality information through the Councils web site and links to the Northern Ireland air quality website (www.airqualityni.co.uk)	DCSDC	Completed	Completed		N/A	Central Northern Ireland Environment Agency (NIEA) web-site up and running and containing Derry CC's LAQM Reports and all monitoring site data/pollutant monitoring		Ongoing	Allows public to keep up to date on current local and provincial air quality issues. Website reviewed and updated
	M20	Vehicle emission tests	Consider the provision of free vehicle emissions testing for motorists and supporting information about responsible car ownership, highlight vehicle pollution issues, eco driving and alternatives to the motor car	DCSDC	To be considered as part of future action plan and	To be considered as part of future action plan	No of vehicles checked	N/A	No emissions testing due to lack of funds - grant bid not supported. To be reviewed as part of revised Action Plan.		To be considered as part of future action plan	To be considered as part of future action plan
To reduce air pollution through Statutory Functions	M21	Development Control	Use Planning Process to ensure potential air quality issues are assessed. Comment upon planning applications to ensure that all relevant air quality issues are highlighted and	DCSDC	Completed	Ongoing	Sustainable development which considers environmental as well as socio-economic impact	N/A	Ongoing		Ongoing	Increased capital cost of development. Perceived reduction in development opportunities

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Category	No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in AQMA	Progress to Date	Progress in last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
			mitigation measures are considered wherever possible									
	M22	Sustainable Development	Sustainable policies incorporated into Councils Local Development Plan and Community Plan and includes development and implementation of a revised sub-Regional Integrated Transport Strategy. Continue to comment on forthcoming development policies for DCSDC to ensure that sustainable development and air quality considerations are included.	DCSDC	Ongoing Consultation	Ongoing	Incorporation of sustainable development in draft Local Development Plan and Community Plan	N/A	Draft Regeneration Plan - One Plan now replaced by Community Plan and Local Development Plan currently out for consultation		Ongoing	Development of sub-Regional Integrated Transport Strategy linked to the progression (2025) of a number of capital development projects such as an orbital route and third road bridge which will relieve congestion in AQMA's
	M23	Pollution Prevention Control	Permitting and inspection of industrial processes and installations under Part C of the Pollution Prevention and Control (Industrial Emissions) Regulations (NI) 2013	DCSDC	Completed	Ongoing	Compliance with conditions and air pollutant emission limits within permit	N/A	Ongoing inspection programme based on risk assessment		Ongoing	
	M24	Deal with burning of commercial and domestic waste	Take enforcement action under Clean Neighbourhoods and Environment Act (NI) 2011	DCSDC	Completed	Ongoing	Reduced pollution from burning of commercial and domestic waste	N/A	Ongoing response to complaints		Ongoing	
	M25	Recycling	Promoting domestic composting and use of Civic Amenity centres in a bid to reduce pollution from domestic garden bonfires	DCSDC	Completed	Ongoing	Reduced pollution from uncontrolled burning of commercial and domestic waste	N/A	Council's website updated with advice on recycling and composting		Ongoing	
To ensure Air Pollution is Monitored	M26	Monitor ambient air quality throughout the City Council area.	Continue ambient air quality monitoring programmes	DCSDC	Completed	Ongoing	Decisions on future air quality policies based on accurate and ratified monitoring data. Identification of areas of poor air quality.	N/A	Ongoing	Detailed Assessments, USA and Progress Reports undertaken	Ongoing	Assessment of continuous NO ₂ levels at Creggan Road
	M27		Evaluate results from air quality monitoring against air quality objectives									
	M28		Install and maintain air quality equipment in areas of potential poor air quality									
	M29		Continue to assist Governmental in the									

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Category	No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in AQMA	Progress to Date	Progress in last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
			development and implementation of polices in relation to Air quality.						monitor) New PM10+2.5 BAM units, new SO2, NO2 and Ozone analysers installed at Rosemount AURN site		Nov 2019-Jan 2010	
Measures considered as part of the Further Assessments of Dale's Corner and Buncrana Road AQMAs	M30	Realignment of the A2 Limavady Road away from nearest properties	Major works programme with land- owner compensated	DfI Roads)	Measure not feasible.							
	M31	Change in traffic lights sequence to allow more free-moving traffic on the A2 Limavady Road	Deter traffic crossing main through route to allow more traffic to more quickly traverse worst affected part of the AQMA	DfI Roads	Design options being investigated	Ongoing	Reduction in polluting emissions due to more vehicles moving through more quickly through junction	5% to 10% of total NO ₂ (2µg/m ³ to 6µg/m ³)	All traffic light sequencing adjusted to minimise congestion through AQMA's DfI Roads looking at traffic movement through junction as a result of proposed development	Liaison with DfI Roads ongoing	2-3 years (2021). Works to junction may be development led	
	M32	Implement restrictions on HGV traffic at Dale's Corner junction	Remove the worst polluting vehicles	DfI Roads	Measure previously not feasible. Consideration to be given to the feasibility of a Low Emissions Zone / Orbital route with 3 rd road-bridge as part of Strategic Community Plan. Currently no alternative route until completion of 3 rd Orbital route. LEZ may be explored as part of revised Action plan							
	M33	Implement restrictions on HGV traffic at Buncrana Road	Remove the worst polluting vehicles	DfI Roads	Measure previously not feasible. Consideration to be given to the feasibility of a Low Emissions Zone / Orbital route with 3 rd road-bridge as part of the Strategic Community Plan. NO ₂ diffusion tube results show NO2 compliance limits by 2018 (38ug/m ³)							

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

The Council has examined the results from monitoring in the district. There were no exceedances of any objectives outside the existing AQMA boundaries, or within the Spencer Road AQMA. In 2018, DCSDC revoked the Strabane, Newtownstewart and Castlederg AQMA's for particulates (PM10). The measures outlined in the former Action Plan for Strabane were realised and pollution levels reduced to well below health limit values. The Smoke Control Areas still remain. The Strand Road AQMA for nitrogen dioxide was revoked in 2018 and the Spencer Road AQMA was reduced in size to reflect updated monitoring and modelling results. It is now recommended that the Spencer Road AQMA be revoked due to continually reduced NO₂ concentrations. The remaining AQMAs are considered appropriate for the time-being.

10.2 Conclusions relating to New Local Developments

Having assessed the relevant planning applications in the Council district, it was concluded that they would have no significant negative impact on existing local air quality. In addition, no significant changes in local circumstances were identified within the Council district, which would require further assessment. It is therefore not considered necessary to proceed to a 'Detailed Assessment' for any of the new local developments or potential sources.

10.3 Other Conclusion

No significant changes in emissions sources within the Council area have been identified. No new developments have been identified which would significantly impact on air quality at relevant locations.

10.4 Proposed Actions

It is recommended that the AQMA at Spencer Road should be revoked. The remaining AQMAs are considered appropriate and should remain unchanged for the time-being.

The Council is currently revising the Air Quality Action Plan to reflect the new Council boundary. The Action Plan shall contain measures to be introduced to work towards achieving air quality objectives within the remaining AQMAs to improve health and wellbeing across the Council area.

11 References

Defra (2007) *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland*, Defra.

Defra (2016) *Review & Assessment: Technical Guidance LAQM.TG16*, Defra.

Defra 'Workplace Analysis Scheme for Proficiency (WASP) NO₂ diffusion tubes proficiency tests'. <http://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html>

Northern Ireland Air – Air Quality in Northern Ireland website
<http://www.airqualityni.co.uk/>

The Environment (Northern Ireland) Order 2002, Statutory Instrument 3153 (2002), HMSO. 2. <http://www.legislation.gov.uk/nisi/2002/3153/contents/made>

Appendices

Appendix A: QA/QC Data

Appendix B: Air Quality Report- Dale's Corner

Appendix C: Air Quality Report- Springhill Park, Strabane

Appendix D: Air Quality reports – Strathfoyle, Derry

Appendix E: Calculations of Precision and Accuracy of Triplicate Tubes- Dale's Corner

Appendix F: Calculations of Precision and Accuracy of Triplicate Tubes- Derry Rosemount

Appendix G: Distance Correction for NO₂ diffusion tubes at Dale's Corner Roadside site

Appendix A: QA/QC Data

Diffusion Tube Bias Adjustment Factors

The diffusion tubes for 2018 were supplied and analysed by Socotec Didcot utilising the 50% triethanolamine (TEA) in acetone preparation method. Bias adjustment factors of 0.76, 0.76 and 0.77 for the years 2016, 2017 and 2018 respectively have been obtained from the national bias adjustment calculator¹.

Factor from Local Co-location Studies (if available)

Two local co-location studies have been undertaken at the Rosemount AURN and Dale's Corner automatic sites. Local bias adjustment factors of 0.79, 0.83 and 0.86 and 0.75 have been calculated for the years 2015, 2016 2017 and 2018 respectively, as shown in Table A.1.

	2015	2016	2017	2018
Rosemount AURN	0.77	0.72	0.72	0.63
Dale's Corner	0.8	0.99	0.99	0.86
Overall Factor ^a	0.79	0.83	0.86	0.75

Discussion of Choice of Factor to Use

The Technical Guidance LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tubes. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data from NO_x / NO₂ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias adjustment factors for the relevant laboratory and preparation method.

The local bias adjustment factor was used in this report for reasons previously discussed.

PM Monitoring Adjustment

No adjustment to the PM monitoring data was required.

Short-term to Long-term Data Adjustment

There was no requirement to undertake this in the report.

QA/QC of Automatic Monitoring

The Rosemount AURN site is managed to the UK Automatic Urban and Rural Network (AURN) QA procedures and standard. The National Physical Laboratory (NPL) undertook the Quality Assurance/Quality Control (QA/QC) procedures at the two monitoring sites during 2018, ensuring that measurements from the analysers were as accurate as possible. Manual calibration of automatic monitors was undertaken every two weeks by the Council's officers. This allowed the instrument drifts to be fully quantified and documented using traceable calibration gas standards and the results are used to scale data. The analysers were checked and serviced every six months by the appointed equipment support contractors. The reports were then sent to NPL.

QA/QC of Diffusion Tube Monitoring

SOCOTEC, formerly ESG Didcot, has participated in the AIR NO₂ PT scheme since it started in April 2014, and participated in the Workplace Analysis Scheme for Proficiency (WASP) for NO₂ diffusion tube analysis prior to this. These schemes provide strict performance criteria for participating laboratories to meet, thereby ensuring NO₂ concentrations reported are of a high calibre. AIR is an independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). AIR PT is a new scheme, started in April 2014, which combines two long running PT schemes: LGC Standards STACKS PT scheme and HSL WASP PT scheme. AIR offers a number of test samples designed to test the proficiency of laboratories undertaking analysis of chemical pollutants in ambient indoor, stack and workplace air. One such sample is the AIR NO₂ test sample type that is distributed to participants in a quarterly basis. AIR NO₂ PT forms an integral part of the UK NO₂ Network's QA/QC. The scores achieved by SOCOTEC are shown in Table A.2. The

Derry City and Strabane District Council

percentage score reflects the results deemed to be satisfactory based upon the z-score of $< \pm 2$.

Laboratory summary performance for AIR NO2 PT rounds AR0019, 21, 22, 24, 25, 27, 28 and 30.

AIR PT Round	AIR PT AR019	AIR PT AR021	AIR PT AR022	AIR PT AR024	AIR PT AR025	AIR PT AR027	AIR PT AR028	AIR PT AR030
Round conducted in the period	April – May 2017	July – August 2017	September – October 2017	January – February 2018	April – May 2018	July – August 2018	September – October 2018	January – February 2019
SOCOTEC	100% [1]	100%[1]	100% [1]	100% [1]	100% [1]	100% [1]	100% [1]	87.5% [1]

[1] Participant subscribed to two sets of test results (2 x 4 test samples) in each AIR PT round.

Appendix B

Air Quality Report

Produced by AQDM on behalf of Derry

DERRY DALE'S CORNER 2018

These data have been fully ratified by AQDM to the LAQM (TG16) standards

Site Environment and Description

KERBSIDE: Corner of King Street and Melrose Terrace

Statistical Summary Report

This 2018 report contains all the statistics required for the LAQM reporting.

First table – Air Quality Statistics

The top four lines show the duration within the bands of the Daily Air Quality Index (DAQI). This was introduced by Defra on January 2012 and revised April 2013. The number of occasions within each band is summarised as follows.

DAQI Pollutant	Moderate	High	Very High
NO ₂	1 hour	0	0

Nitrogen Dioxide was Moderate on 4th Feb with an hourly mean reaching 205 µg m⁻³.

Data Captures

The annual data captures are shown on the bottom line. These were above the 85% target.

Second table – Air Quality

Exceedences NO₂ – annual data capture was 98.6 %

The annual mean was 32 µg m⁻³ which did not exceed the 40 µg m⁻³ Objective.

The maximum hourly mean was 205 µg m⁻³ so there was 1 exceedence of the NO₂ hourly limit of 200 µg m⁻³. There is an annual allowance of 18 hours so this Objective was not exceeded.

Air Quality Report

DERRY DALE'S CORNER 2018 Air Quality Statistics

Pollutant	NO ₂	NO	NO _x
Number Very High #	0	-	-
Number High #382	0	-	-
Number Moderate #	1	-	-
Number Low #	8640	-	-
Maximum 15-min mean	233 µg m ⁻³	555 µg m ⁻³	1084 µg m ⁻³
Maximum hourly mean	205 µg m ⁻³	479 µg m ⁻³	939 µg m ⁻³
Maximum running 8-hr mean	112 µg m ⁻³	244 µg m ⁻³	474 µg m ⁻³
Maximum running 24-hr mean	81 µg m ⁻³	127 µg m ⁻³	264 µg m ⁻³
Maximum daily mean	76 µg m ⁻³	127 µg m ⁻³	263 µg m ⁻³
Average	32 µg m ⁻³	25 µg m ⁻³	71 µg m ⁻³
Data capture	98.6 %	98.6 %	98.6 %

Daily Air Quality Index (DAQI) as defined by COMEAP January 2012 and revised April 2013 Mass units for the gases are at 20°C and 1013mb NO_x mass units are NO_x as NO₂ µg m⁻³

Air Quality Exceedences

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Max Conc	Number	Days	Allowed	Exceed
Nitrogen Dioxide	Annual mean > 40 µg m ⁻³	32 µg m ⁻³	0	-	-	No
Nitrogen Dioxide	Hourly mean > 200 µg m ⁻³	205 µg m ⁻³	1	1	18 hours	No

Air Quality Report

DERRY DALE'S CORNER 2018

Monthly Data Captures %

Pollutant	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Nitrogen Dioxide	100.0	99.7	97.8	99.9	98.3	96.1	97.6	95.3	99.9	99.3	100.0	100.0

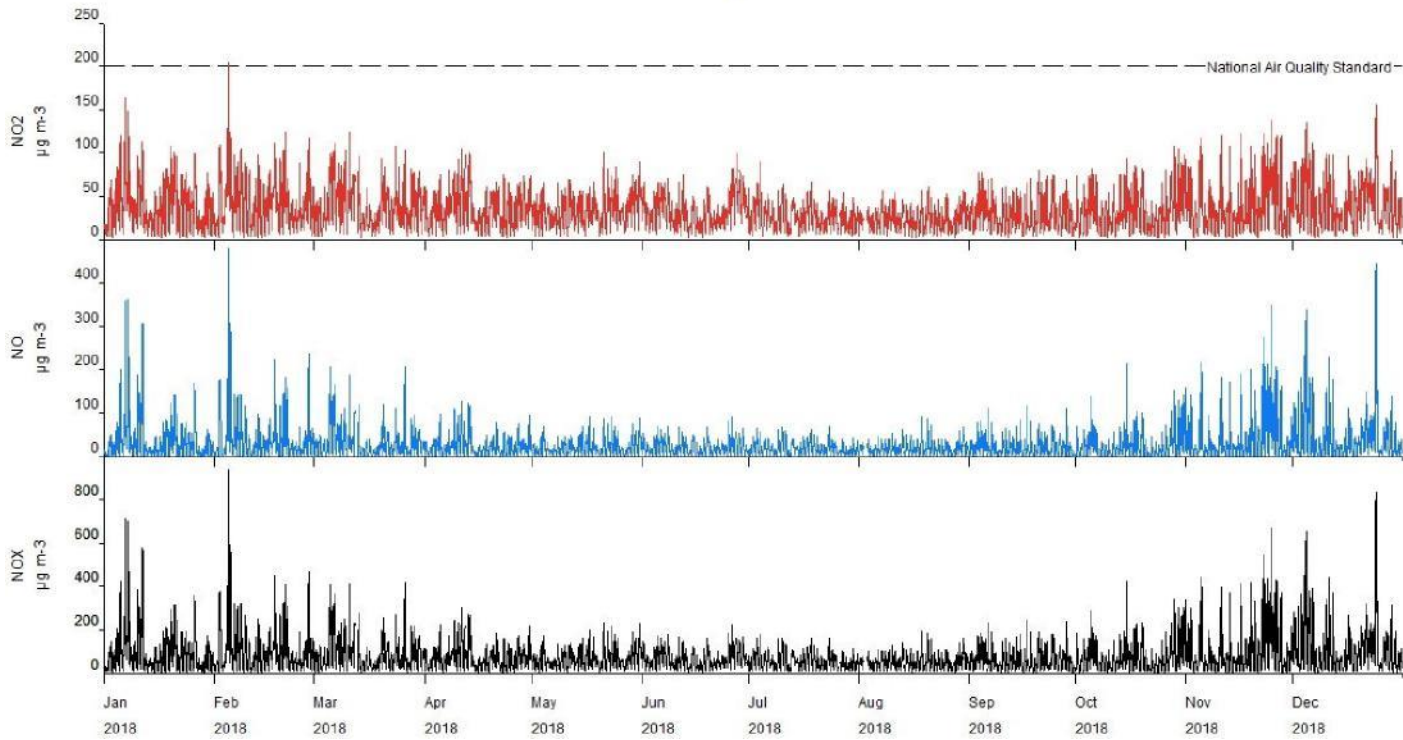
Monthly Means

Pollutant	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Nitrogen Dioxide $\mu\text{g m}^{-3}$	35	39	36	32	31	30	25	22	29	33	36	38

Air Quality Report

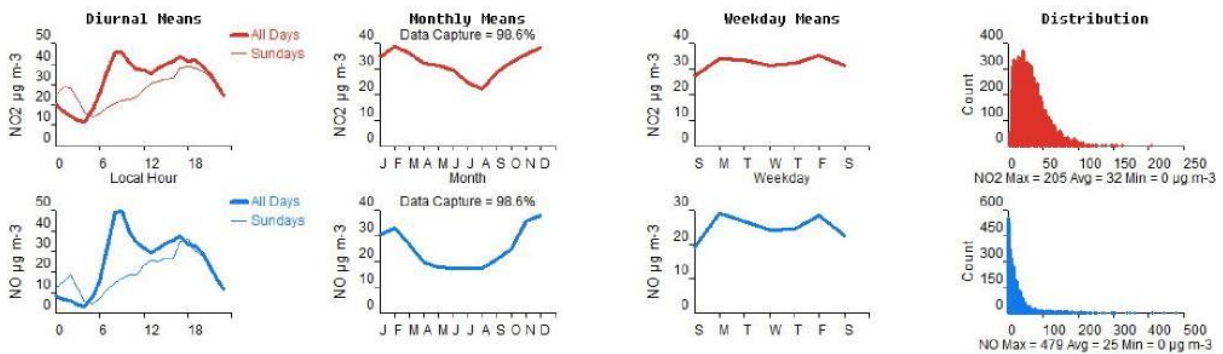
DERRY DALE'S CORNER 2018

Hourly Means



Air Quality Report

DERRY DALE'S CORNER 2018



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Appendix C

Air Quality Report

Produced by AQDM on behalf of Strabane

STRABANE SPRINGHILL PARK 2018

These data have been fully ratified by AQDM to the LAQM (TG16) standards

Site Environment and Description

URBAN BACKGROUND: Springhill Park

Statistical Summary Report

This 2018 report contains all the statistics required for the LAQM reporting.

First table – Air Quality Statistics

The gravimetric PM_{10} (BAM / 1.21) is shown in the 2nd column while the uncorrected BAM PM_{10} is in the 3rd.

The top four lines show the duration within the bands of the Daily Air Quality Index (DAQI). This was introduced by Defra on January 2012 and revised April 2013. The number of occasions within each band is summarised as follows.

DAQI Pollutant	Moderate	High	Very High
Gravimetric PM_{10}	0 days	0	0
SO ₂	0 15-minutes	0	0

Data Captures

The annual data captures are shown on the bottom line. These were above the 85% target.

Second table – Air Quality Exceedences

Gravimetric PM_{10} – annual data capture was 85.7 %

The maximum daily mean was $44 \mu\text{g m}^{-3}$ so the daily mean limit value of $50 \mu\text{g m}^{-3}$ was not exceeded. The annual allowance is 35 days so this Objective was not exceeded.

The annual mean was $15 \mu\text{g m}^{-3}$ which did not exceed the $40 \mu\text{g m}^{-3}$ Objective.

SO₂ – annual data capture was 99.5 %

The maximum 15-minute mean was $64 \mu\text{g m}^{-3}$ so the $266 \mu\text{g m}^{-3}$ limit was not exceeded. There is an annual allowance of 35 15-minute means so the Objective was not exceeded.

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The maximum hourly mean was $45 \mu\text{g m}^{-3}$ so the $350 \mu\text{g m}^{-3}$ limit was not exceeded. There is an annual allowance of 24 hours so the Objective was not exceeded.

The maximum daily mean was $13 \mu\text{g m}^{-3}$ so the $125 \mu\text{g m}^{-3}$ limit was not exceeded. There is an annual allowance of 3 days so the Objective was not exceeded.

The annual mean was $3 \mu\text{g m}^{-3}$ which did not exceed the $20 \mu\text{g m}^{-3}$ Objective.

Air Quality Report

STRABANE SPRINGHILL PARK 2018

Air Quality Statistics

Pollutant	PM ₁₀ ⁺	PM ₁₀ *	SO ₂
Number Very High #	0	-	0
Number High #	0	-	0
Number Moderate #	0	-	0
Number Low #	302	-	34494
Maximum 15-min mean	-	-	$64 \mu\text{g m}^{-3}$
Maximum hourly mean	$172 \mu\text{g m}^{-3}$	$206 \mu\text{g m}^{-3}$	$45 \mu\text{g m}^{-3}$
Maximum running 8-hr mean	$84 \mu\text{g m}^{-3}$	$101 \mu\text{g m}^{-3}$	$27 \mu\text{g m}^{-3}$
Maximum running 24-hr mean	$45 \mu\text{g m}^{-3}$	$54 \mu\text{g m}^{-3}$	$13 \mu\text{g m}^{-3}$
Maximum daily mean	$44 \mu\text{g m}^{-3}$	$53 \mu\text{g m}^{-3}$	$13 \mu\text{g m}^{-3}$
Average	$15 \mu\text{g m}^{-3}$	$18 \mu\text{g m}^{-3}$	$3 \mu\text{g m}^{-3}$
Data capture	85.7 %	85.7 %	99.5 %

Daily Air Quality Index (DAQI) as defined by COMEAP January 2012 and revised April 2013
 + PM₁₀ as measured by a BAM using a gravimetric factor of 0.833 for Indicative Gravimetric Equivalent * PM₁₀ as measured by a BAM
 Mass units for the gases are at 20°C and 1013mb

Air Quality Exceedences

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Max Conc	Number	Days	Allowed	Exceeded
PM ₁₀ Particulate Matter (Gravimetric)	Daily mean > $50 \mu\text{g m}^{-3}$	$44 \mu\text{g m}^{-3}$	0	0	35 days	No

Derry City and Strabane District Council

PM ₁₀ Particulate Matter (Gravimetric)	Annual mean > 40 µg m ⁻³	15 µg m ⁻³	0	-	-	No
Sulphur Dioxide	15-minute mean > 266 µg m ⁻³	64 µg m ⁻³	0	0	35 15 mins	No
Sulphur Dioxide	Hourly mean > 350 µg m ⁻³	45 µg m ⁻³	0	0	24 hours	No
Sulphur Dioxide	Daily mean > 125 µg m ⁻³	13 µg m ⁻³	0	0	3 days	No
Sulphur Dioxide	Annual mean > 20 µg m ⁻³	3 µg m ⁻³	0	-	-	No

Air Quality Report

STRABANE SPRINGHILL

PARK 2018

Monthly Data Captures %

Pollutant	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
PM ₁₀	94.8	99.1	84.8	48.8	67.7	91.0	79.8	80.4	87.6	96.2	99.4	99.7
Sulphur Dioxide	99.9	99.9	99.6	98.9	99.9	100.0	99.7	97.6	98.9	100.0	99.7	99.9

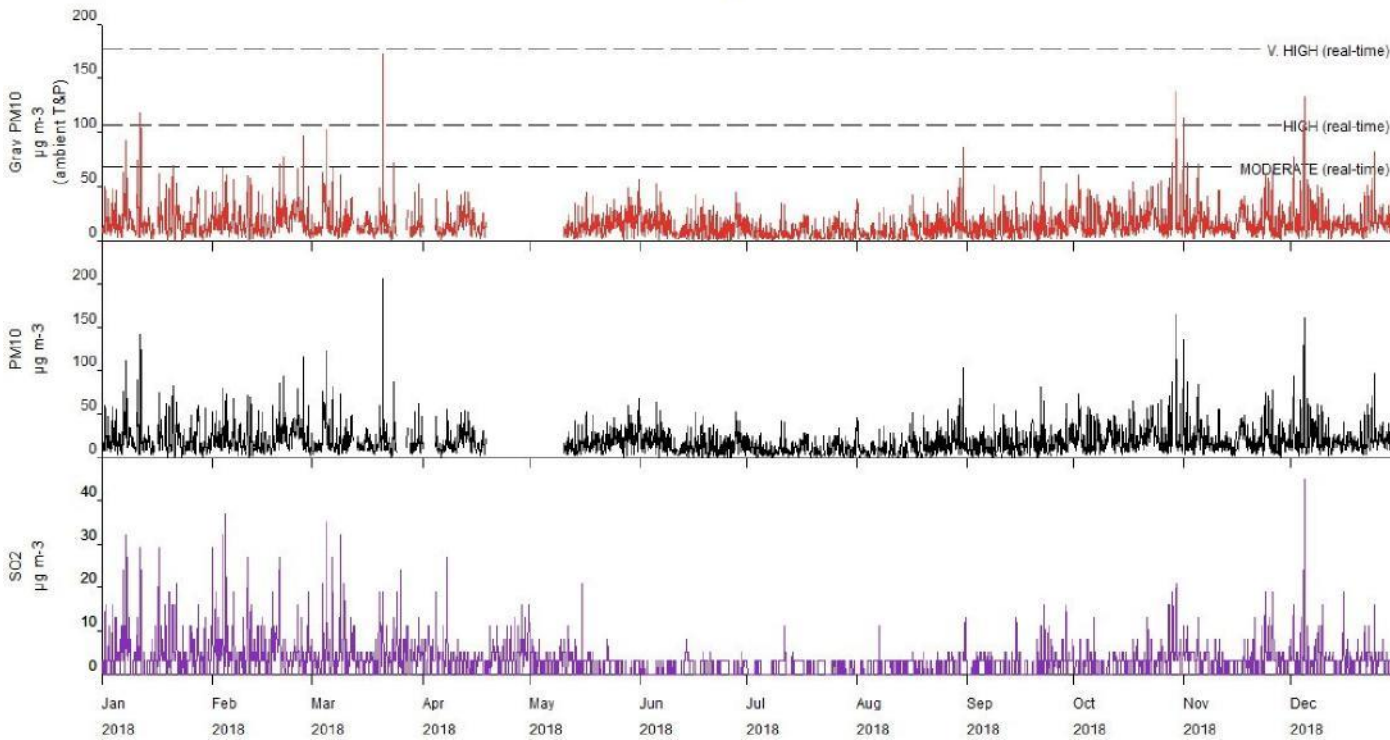
Monthly Means

Pollutant	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
PM ₁₀ µg m ⁻³	18	19	16	14	15	13	8	11	13	19	16	19
Sulphur Dioxide µg m ⁻³	5	5	5	4	2	1	1	2	2	3	3	3

Air Quality Report

STRABANE SPRINGHILL PARK 2018

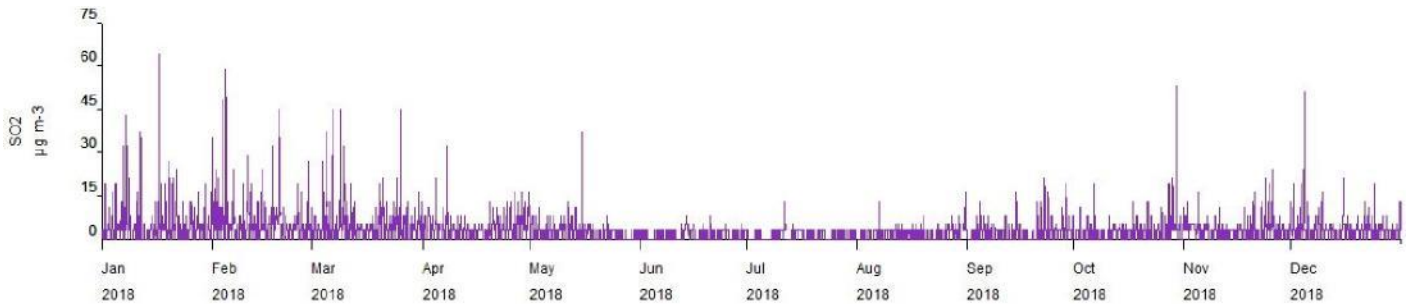
Hourly Means



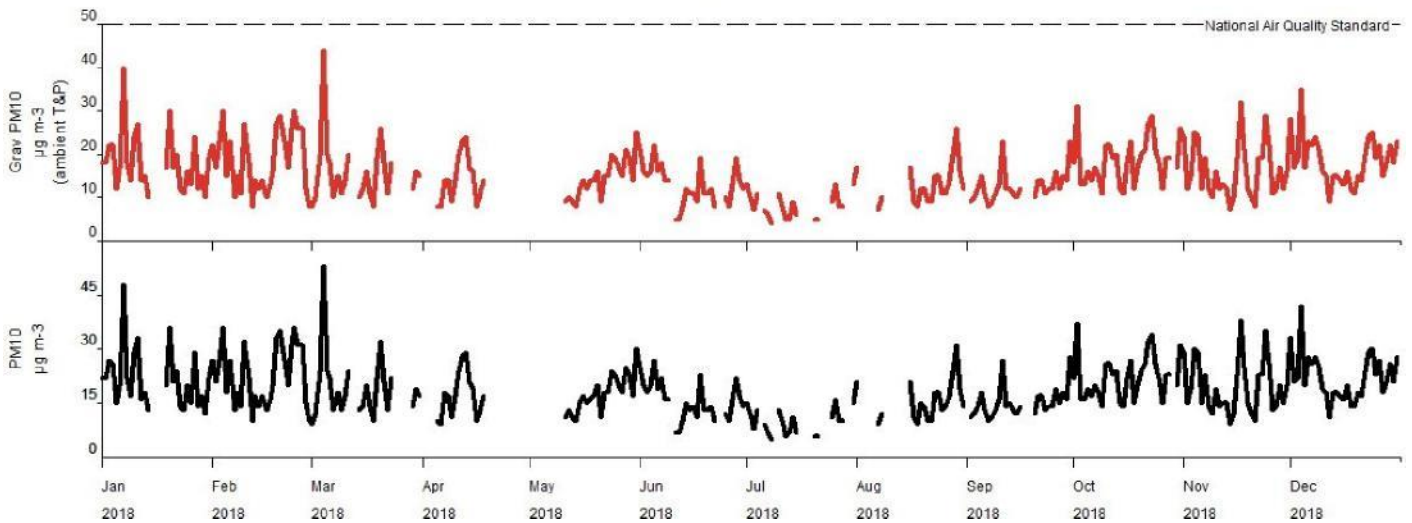
Air Quality Report

STRABANE SPRINGHILL PARK 2018

15-min Means

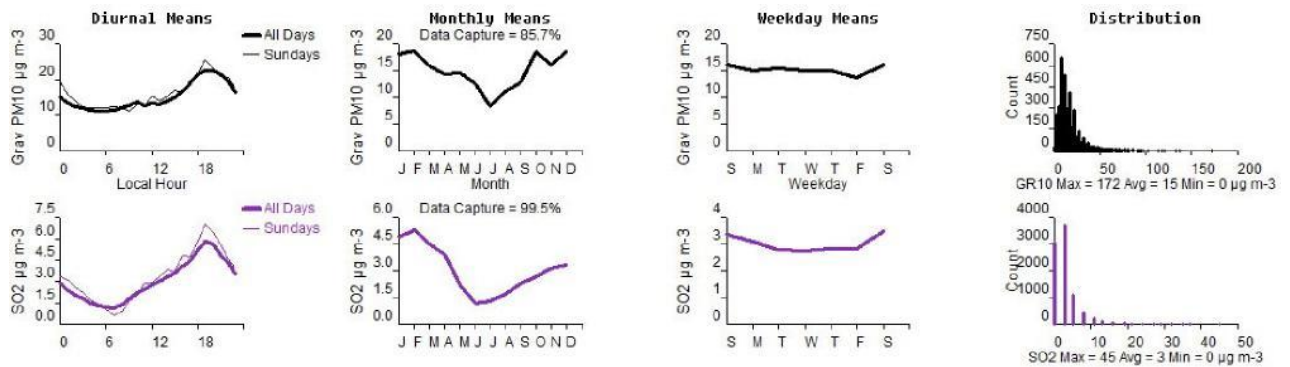


Daily Means



Air Quality Report

STRABANE SPRINGHILL PARK 2018



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Appendix D:

Air Quality Report

Produced by AQDM on behalf of Derry

DERRY STRATHFOYLE 2018

These data have been fully ratified by AQDM to the LAQM (TG16) standards
Site started 1st August 2018

Site Environment and Description

URBAN BACKGROUND: 33 Bawnmore Place, Strathfoyle

Statistical Summary Report

This 2018 report contains all the statistics required for the LAQM reporting.

The Volatile Correction Model (VCM) has been run on the TEOM data to calculate the *EU Reference Equivalent* PM₁₀ required for the LAQM reports. This uses data from at least two nearby FDMS instruments <http://www.volatile-correction-model.info>.

First table – Air Quality Statistics

The TEOM gravimetric PM₁₀ is shown in the 2nd column. The uncorrected TEOM PM₁₀ is in the 3rd.

The top four lines show the duration within the bands of the Daily Air Quality Index (DAQI). This was introduced by Defra on January 2012 and revised April 2013. The number of occasions within each band is summarised as follows.

DAQI Pollutant	Moderate	High	Very High
Gravimetric PM ₁₀	0 days	0	0

Data Captures

The annual data captures are shown on the bottom line. These were below the 85% target.

High percentiles are included where the annual data capture was less than 85%.

Second table – Air Quality Exceedences

Gravimetric PM₁₀ – annual data capture was 38.2 % and 91.1% for the monitoring period The maximum daily mean was 31 µg m⁻³ so the daily mean limit value of 50 µg m⁻³ was not exceeded. The annual allowance is 35 days so this Objective was not exceeded.

The annual mean was 13 µg m⁻³ which did not exceed the 40 µg m⁻³ Objective. Note the very low annual data capture.

Air Quality Report

DERRY STRATHFOYLE 2018

Air Quality Statistics

Pollutant	PM ₁₀ ⁺	PM ₁₀ [*]
Number Very High #	0	-
Number High #	0	-
Number Moderate #	0	-
Number Low #	140	-
Maximum 15-min mean	-	300 µg m ⁻³
Maximum hourly mean	100 µg m ⁻³	92 µg m ⁻³
Maximum running 8-hr mean	55 µg m ⁻³	49 µg m ⁻³
Maximum running 24-hr mean	38 µg m ⁻³	34 µg m ⁻³
Maximum daily mean	31 µg m ⁻³	28 µg m ⁻³
90.4 th percentile of daily means [†]	19 µg m ⁻³	-
90 th percentile of daily means [†]	18 µg m ⁻³	-
98.1 st percentile of daily means [†]	25 µg m ⁻³	-
Average	13 µg m ⁻³	11 µg m ⁻³
Data capture	38.2 %	38.2 %
Data capture from 1 st August	91.1 %	91.1 %

Daily Air Quality Index (DAQI) as defined by COMEAP January 2012 and revised April 2013 † Percentile required for annual data capture < 85%

+ PM₁₀ as measured by a TEOM using the VCM for Indicative Gravimetric Equivalent

* PM₁₀ as measured by a TEOM

Air Quality Exceedences

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Max Conc	Number	Days	Allowed	Exceeded
PM ₁₀ Particulate Matter (Gravimetric)	Daily mean > 50 µg m ⁻³	31 µg m ⁻³	0	0	35 days	No
PM ₁₀ Particulate Matter (Gravimetric)	Annual mean > 40 µg m ⁻³	13 µg m ⁻³	0	-	-	No

Air Quality Report

DERRY STRATHFOYLE 2018

Monthly Data Captures %

Pollutant	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
PM ₁₀	0.0	0.0	0.0	0.0	0.0	0.0	0.0	71.5	98.3	98.0	99.0	89.0

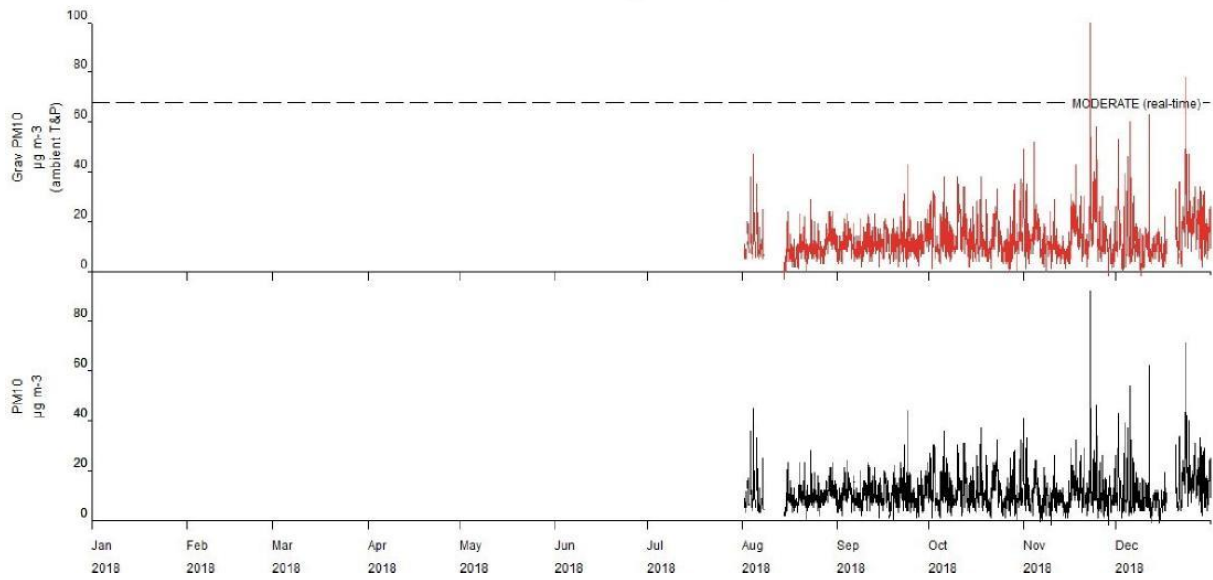
Monthly Means

Pollutant	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
PM ₁₀ µg m ⁻³	-	-	-	-	-	-	-	10	11	13	13	14

Air Quality Report

DERRY STRATHFOYLE 2018

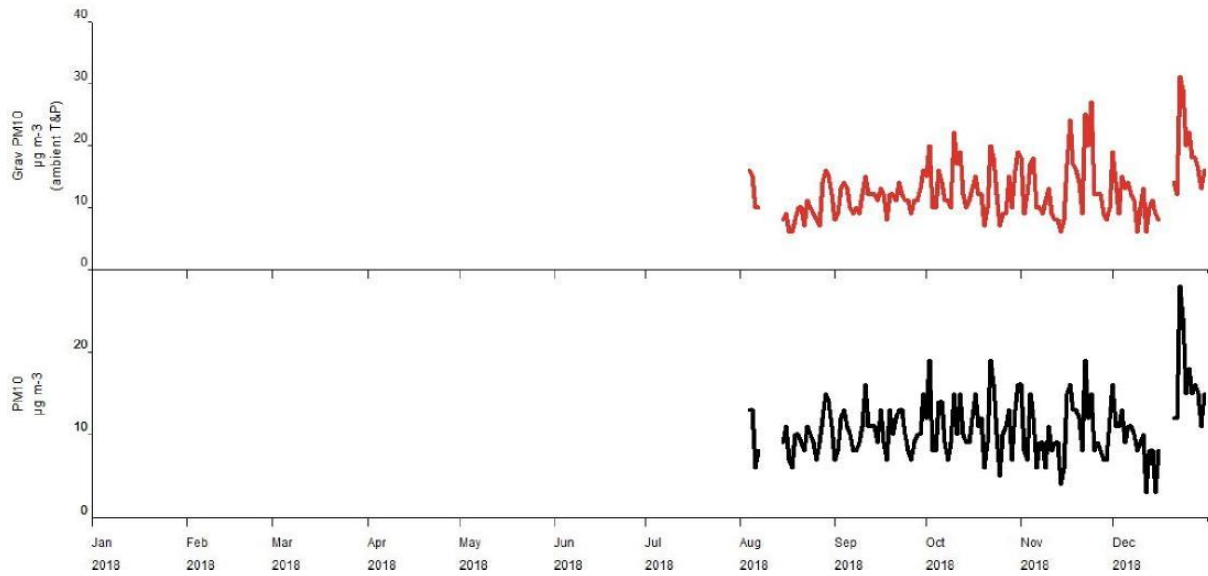
Hourly Means



Air Quality Report

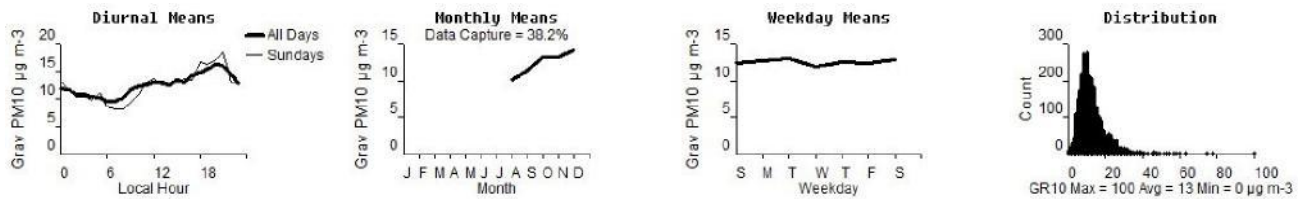
DERRY STRATHFOYLE 2018

Daily Means



Air Quality Report

DERRY STRATHFOYLE 2018



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Appendix E: Annualisation of 14 Creggan Road Diffusion Tube Data.

Start	End	Rosemount (A)	Ballymena Ballykeel (B)	Armagh Lonsdale (C)	Diffusion Tube 14 Creggan Road (average) D1
02/01/2018	29/01/2018	12.21	25.76	33.6	47.05
29/01/2018	26/02/2018	10.83	24.34	41.5	48.2
26/02/2018	28/03/2018	10.68	16.5	32.3	50.8
28/03/2018	30/04/2018	11.33	14.95	23.6	49.95
30/04/2018	05/06/2018	8.7	14.12	20.8	50.6
29/10/2018	03/12/2018	15.42	20.1	28.6	50.2
03/12/2018	07/01/2019	12.71	19.8	29.3	42.6
Average		11.69714286	19.36714286	29.95714286	48.5

Background Site	Annual Mean 2018 (Am)	Period Mean 2018 (Pm)	Ratio (Am/Pm)
A(Rosemount)	10	11.7	0.85
B(Ballymena Ballykeel)	16	19.37	0.83
C(Armagh Lonsdale)	25	30	0.83
Average	17	20.4	0.84

$$D1 \times \text{Ratio} = 48.5 \times 0.84$$

$$=40.74$$

Derry City and Strabane District Council

Appendix F: Calculations of Precision and Accuracy of Triplicate Tubes- Dale's Corner



Checking Precision and Accuracy of Triplicate Tubes

Diffusion Tubes Measurements									
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	02/01/2018	29/01/2018	45.9	41.9	43	44	2.1	5	5.1
2	29/01/2018	26/02/2018	43.7	38.4	38.9	40	2.9	7	7.3
3	26/02/2018	27/03/2018	42.3	40.4	43.1	42	1.4	3	3.4
4	27/03/2018	30/04/2018	38.7	38	35.5	37	1.7	4	4.2
5	30/04/2018	05/06/2018	35.9	39.5	38.8	38	1.9	5	4.7
6	05/06/2018	02/07/2018	35.5	37.1	35.6	36	0.9	2	2.2
7	02/07/2018	30/07/2018	27.4	29.7	27.7	28	1.3	4	3.1
8	30/07/2018	03/09/2018	27.7	26.7	25.8	27	1.0	4	2.4
9	03/09/2018	01/10/2018	31.4	31.9	32.3	32	0.5	1	1.1
10	01/10/2018	29/10/2018	37.5	37.6	35.8	37	1.0	3	2.5
11	29/10/2018	03/12/2018	45.9	48.1	46.1	47	1.2	3	3.0
12	03/12/2018	07/01/2019	45	41	30.5	39	7.5	19	18.6
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
36.4	100	Good	Good
37.6	100	Good	Good
35.6	98	Good	Good
32.8	100	Good	Good
31.2	98	Good	Good
28.0	96	Good	Good
24.6	98	Good	Good
21.6	95	Good	Good
29.2	100	Good	Good
30.9	99	Good	Good
38.0	100	Good	Good
37.6	100	Good	Good

Overall survey -->

Good precision	Good Overall DC
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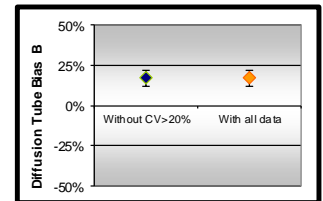
(Check average CV & DC from Accuracy calculations)

Site Name/ ID:	Dales Corner
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Precision	12 out of 12 periods have a CV smaller than 20%
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Accuracy (with 95% confidence interval)	
without periods with CV larger than 20%	
Bias calculated using 12 periods of data	
Bias factor A	0.86 (0.82 - 0.9)
Bias B	16% (12% - 21%)
Diffusion Tubes Mean:	37 μgm^{-3}
Mean CV (Precision):	5
Automatic Mean:	32 μgm^{-3}
Data Capture for periods used:	99%
Adjusted Tubes Mean:	32 (31 - 34) μgm^{-3}

Accuracy (with 95% confidence interval)	
WITH ALL DATA	
Bias calculated using 12 periods of data	
Bias factor A	0.86 (0.82 - 0.9)
Bias B	16% (12% - 21%)
Diffusion Tubes Mean:	37 μgm^{-3}
Mean CV (Precision):	5
Automatic Mean:	32 μgm^{-3}
Data Capture for periods used:	99%
Adjusted Tubes Mean:	32 (31 - 34) μgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

Appendix G: Calculations of Precision and Accuracy of Triplicate Tubes- Derry Rosemount

Checking Precision and Accuracy of Triplicate Tubes



Diffusion Tubes Measurements									
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	02/01/2018	29/01/2018	21.6	21.1	24.2	22	1.7	7	4.1
2	29/01/2018	26/02/2018	18.8	19.3	18.3	19	0.5	3	1.2
3	26/02/2018	27/03/2018	20.7	19.1	20.7	20	0.9	5	2.3
4	27/03/2018	30/04/2018	15.2	13.6	13.8	14	0.9	6	2.2
5	30/04/2018	05/06/2018	11.1	12.3	11.9	12	0.6	5	1.5
6	05/06/2018	02/07/2018	11.9	10.8	9.7	11	1.1	10	2.7
7	02/07/2018	30/07/2018	7.1	7.2	7.4	7	0.2	2	0.4
8	30/07/2018	03/09/2018	6.9	6.2	7.1	7	0.5	7	1.2
9	03/09/2018	01/10/2018	10.4	8.5	9.8	10	1.0	10	2.4
10	01/10/2018	29/10/2018	14.9	15.1	14.9	15	0.1	1	0.3
11	29/10/2018	03/12/2018	23.2	25	18.9	22	3.1	14	7.8
12	03/12/2018	07/01/2019	16.3	22.3	21.7	20	3.3	16	8.2
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
12.1	98	Good	Good
10.7	100	Good	Good
11.3	89	Good	Good
10.9	100	Good	Good
8.6	100	Good	Good
7.7	100	Good	Good
4.8	100	Good	Good
4.5	96	Good	Good
5.9	100	Good	Good
8.7	100	Good	Good
15.3	100	Good	Good
11.7	100	Good	Good

Overall survey -->

Site Name/ ID: **Rosemount**

Precision **12 out of 12 periods have a CV smaller than 20%**

Good precision **Good Overall DC**
(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 12 periods of data
Bias factor A **0.63 (0.58 - 0.68)**
Bias B **60% (48% - 71%)**

Diffusion Tubes Mean: **15 μgm^{-3}**
Mean CV (Precision): **7**

Automatic Mean: **9 μgm^{-3}**
Data Capture for periods used: **99%**

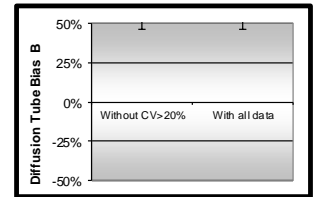
Adjusted Tubes Mean: **9 (9 - 10) μgm^{-3}**

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 12 periods of data
Bias factor A **0.63 (0.58 - 0.68)**
Bias B **60% (48% - 71%)**

Diffusion Tubes Mean: **15 μgm^{-3}**
Mean CV (Precision): **7**

Automatic Mean: **9 μgm^{-3}**
Data Capture for periods used: **99%**

Adjusted Tubes Mean: **9 (9 - 10) μgm^{-3}**

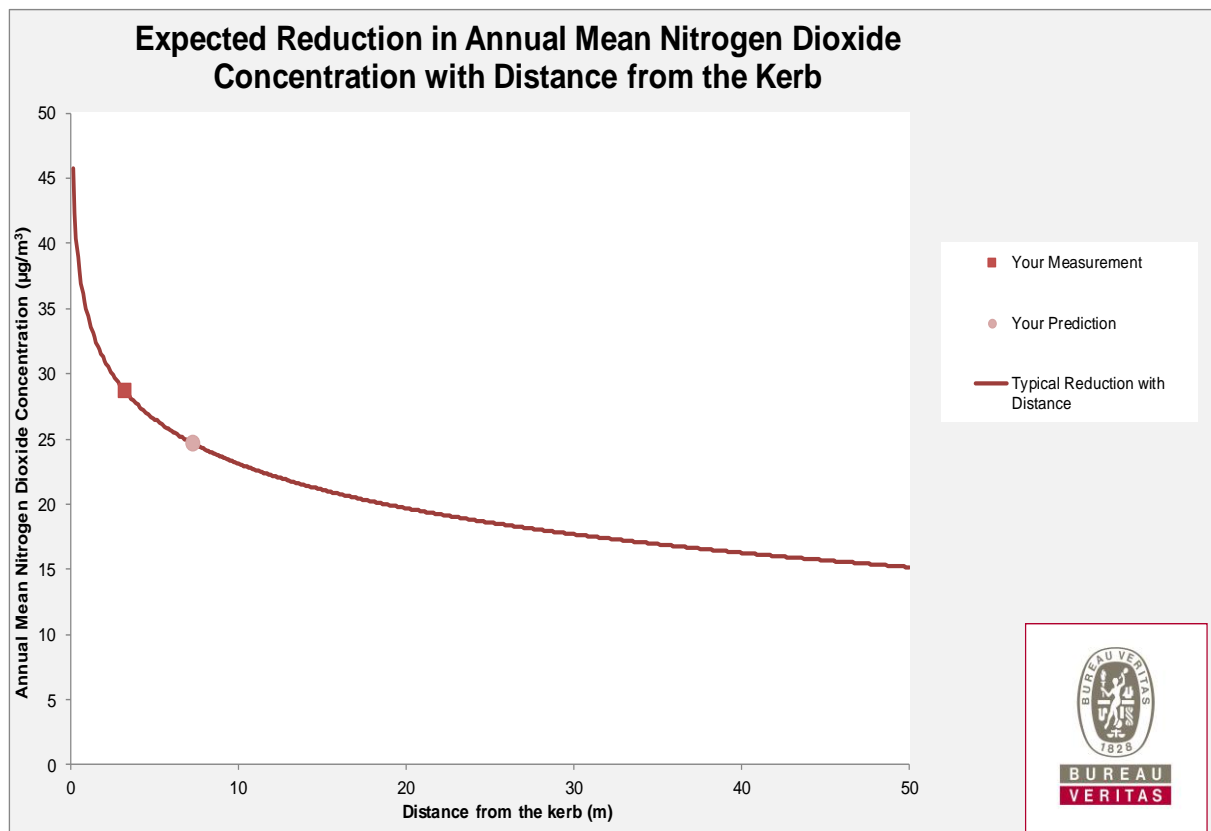


Jaume Targa, for AEA
Version 04 - February 2011

Appendix H: Distance Correction for NO₂ diffusion tubes at Dale's Corner

Roadside site

Step 1	How far from the KERB was your measurement made (in metres)?	3.2	metres
Step 2	How far from the KERB is your receptor (in metres)?	7.3	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	10	µg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	28.7	µg/m ³
Step 5	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	24.6	µg/m ³



Derry City and Strabane District Council

Appendix I - Dales Corner Diffusion Tube Collocation Data Questionnaire

Your Details	Date form filled in	Name of Local Authority	Your name	Phone number	Contact email	
	13/09/2019	Derry City and Strabane District Council	Mark McChrystal	2871253253	info@derrystrabane.com	
Site Details	Distance from kerb (m)	Site type (e.g. roadside, background). Definitions of site types are given on the "Notes" sheet	Distance from diffusion tube(s) to continuous analyser inlet (m) (this should be less than 1m from the analyser inlet)	Location (site name or a brief description)	Grid Reference of Site (if available)	
	3m	Roadside	<1m	Dale's Corner	244178 , 416760	
Diffusion Tube Details	Prepared by	Analysed by	Example results sheet attached? (please attach a results sheet provided by the analysis laboratory)	Preparation method (e.g. 50% TEA in acetone; 50% TEA in water)	How are diffusion tubes deployed? (e.g. with a clip, spacer, shelter box, just tape)	
	Socotec Didcot	Socotec Didcot	Attached	50% TEA in acetone	Clip spacer	
Continuous Analyser Details				Analyser type	QA/QC (e.g. local or network)	
				chemiluminescent monitor	Network	
Data from the Automatic Analyser (Matching Individual Diffusion Tube Periods)						
Period	Start Date (dd/mm/yy)	End Date (dd/mm/yy)	% Data Capture	Ratified / Provisional	NOx (if available) (ug/m ³)	Nitrogen Dioxide (ug/m ³)
1	02/01/2018	29/01/2018	100			36.4
2	29/01/2018	26/02/2018	100			37.6
3	26/02/2018	28/03/2018	98			35.6
4	28/03/2018	30/04/2018	100			32.8
5	30/04/2018	05/06/2018	98			31.2
6	05/06/2018	02/07/2018	96			28
7	02/07/2018	30/07/2018	98			24.6
8	30/07/2018	03/09/2018	95			21.6
9	03/09/2018	01/10/2018	100			29.2
10	01/10/2018	29/10/2018	99			30.9
11	29/10/2018	03/12/2018	100			38
12	03/12/2018	07/01/2019	100			37.6
13						32
Please express NOx as NO ₂ (e.g. ppb x 1.913) or alternatively note the approach / units here:						
When you are identifying the automatic monitoring periods that match your diffusion tube exposure periods, please be as precise as possible. It is not, however, necessary to match start times to the exact hour that you put out your tubes.						
Individual Period (monthly) Mean Nitrogen Dioxide Data from the Diffusion Tubes (ug/m³)						
Period		Tube 1	Tube 2 (if available)	Tube 3 (if available)	Tube 4 (if available)	
1		45.90	41.9	43.0		
2		43.70	38.4	38.9		
3		42.30	40.4	43.1		
4		38.7	38.0	35.5		
5		35.9	39.5	38.8		
6		35.5	37.1	35.6		
7		27.4	29.7	27.7		
8		27.7	26.7	25.8		
9		31.4	31.9	32.3		
10		37.5	37.6	35.8		
11		45.9	48.1	46.1		
12		45.0	41.0	30.5		
13					37.2	
Other Information	Are the concentrations stated in ug/m ³ ?	Did the diffusion tube supply or analysis method change during the monitoring period? When, from what, to what?	Were there any significant problems with the continuous analyser during the monitoring period?	Are there any other relevant issues with your data?		
	Yes	No	No	No		

Derry City and Strabane District Council

Appendix J – Rosemount Diffusion Tube Collocation Data Questionnaire

Your Details	Date form filled in	Name of Local Authority	Your name	Phone number	Contact email	
	27/06/2018	Derry City and Strabane District Council	Mark McChrystal	2871253253	info@derrystrabane.com	
Site Details	Distance from kerb (m)	Site type (e.g. roadside, background). Definitions of site types are given on the "Notes" sheet	Distance from diffusion tube(s) to continuous analyser inlet (m) (this should be less than 1m from the analyser inlet)	Location (site name or a brief description)	Grid Reference of Site (if available)	
	55m	Urban Background	<1m	Derry Rosemount	242962, 417217	
Diffusion Tube Details	Prepared by	Analysed by	Example results sheet attached? (please attach a results sheet provided by the analysis laboratory)	Preparation method (e.g. 50% TEA in acetone; 50% TEA in water)	How are diffusion tubes deployed? (e.g. with a clip, spacer, shelter box, just tape)	
	Socotec Didcot	Socotec Didcot	Attached	50% TEA in acetone	Clip spacer	
Continuous Analyser Details				Analyser type	QA/QC (e.g. local or network)	
				chemiluminescent monitor	Network	
Data from the Automatic Analyser (Matching Individual Diffusion Tube Periods)						
Period	Start Date (dd/mm/yy)	End Date (dd/mm/yy)	% Data Capture	Ratified / Provisional	NOx (if available) (ug/m ³)	Nitrogen Dioxide (ug/m ³)
1	02/01/2018	29/01/2018	98			12.10
2	29/01/2018	26/02/2018	100			10.70
3	26/02/2018	27/03/2018	89			11.30
4	27/03/2018	30/04/2018	100			10.90
5	30/04/2018	05/06/2018	100			8.60
6	05/06/2018	02/07/2018	100			7.70
7	02/07/2018	30/07/2018	100			4.80
8	30/07/2018	03/09/2018	96			4.50
9	03/09/2018	01/10/2018	100			5.90
10	01/10/2018	29/10/2018	100			8.70
11	29/10/2018	03/12/2018	100			15.30
12	03/12/2018	07/01/2018	100			11.70
13						9.4
Please express NOx as NO ₂ (e.g. ppb x 1.913) or alternatively note the approach / units here:						
When you are identifying the automatic monitoring periods that match your diffusion tube exposure periods, please be as precise as possible. It is not, however, necessary to match start times to the exact hour that you put out your tubes.						
Individual Period (monthly) Mean Nitrogen Dioxide Data from the Diffusion Tubes (ug/m³)						
Period		Tube 1	Tube 2 (if available)	Tube 3 (if available)	Tube 4 (if available)	
1		21.60	21.1	24.2		
2		18.80	19.3	18.3		
3		20.70	19.1	20.7		
4		15.2	13.6	13.8		
5		11.1	12.3	11.9		
6		11.9	10.8	9.7		
7		7.10	7.2	7.4		
8		6.90	6.2	7.1		
9		10.4	8.5	9.8		
10		14.90	15.1	14.9		
11		23.20	25.0	18.9		
12		16.30	22.3	21.7		
13					14.9	
Other Information	Are the concentrations stated in ug/m ³ ?	Did the diffusion tube supply or analysis method change during the monitoring period? When, from what, to what?	Were there any significant problems with the continuous analyser during the monitoring period?	Are there any other relevant issues with your data?		
	Yes	No	No	No		