

Annual Progress Report (APR)



**2016 Air Quality Annual Progress Report (APR) for
West Dunbartonshire Council**

**In fulfilment of Part IV of the
Environment Act 1995**

Local Air Quality Management

Date June 2016

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Executive Summary: Air Quality in Our Area

Air Quality in West Dunbartonshire Council

Air quality within the West Dunbartonshire Council area is generally good. We have no Air Quality Management Areas.

West Dunbartonshire Council has two automatic air quality monitoring stations. One, West Dunbartonshire Clydebank, is located at Briar Drive, Clydebank and monitors NO₂, PM₁₀ and PM_{2.5}. The second, West Dunbartonshire Glasgow Road, is situated at the corner of Glasgow Road and Leven Street, Dumbarton. This unit monitors NO₂ only and is part of the Automatic Urban and Rural Network (AURN). Both our automatic sites have co-located NO₂ diffusion tubes.

We also monitored NO₂ using passive diffusion tubes at 24 locations throughout West Dunbartonshire Council. Since the 2015 Update and Screening Assessment monitoring at one diffusion tube (Riddell Street) has stopped as the lampposts were removed. The Riddell Street tube was in place while a new housing development was ongoing. The site is now fully occupied. The diffusion tube results indicated that the National Air Quality Objective for NO₂ was not going to be breached at that location and it was decided not to replace the tube on completion of the upgrading of the lampposts.

Monitoring carried out in the Council area during 2015 did not identify any exceedances of Nitrogen Dioxide (NO₂) objectives nor were the PM₁₀ or the PM_{2.5} objectives breached.

No significant changes in emission sources within the Council area have been identified during 2015.

There have been no new relevant industrial installations and no new or substantially altered roads within the Council area.

There are no new significant commercial, domestic or fugitive sources of emissions.

Actions to Improve Air Quality

West Dunbartonshire Council has not declared an Air Quality Management Area (AQMA).

The Council has adopted the provisions of the Road Traffic (Vehicle Emissions) (Fixed Penalty) (Scotland) Regulations 2003.

During 2015 two vehicle emission testing dates took place. A total of 278 vehicles were stopped and tested. One vehicle failed the emissions test and a fixed penalty notice was issued to the driver of the vehicle.

West Dunbartonshire Council employees also carry out idling engines checks at shopping centres, taxi ranks and bus termini throughout the year. In addition we respond to complaints from members of the public regarding idling engines and vehicle emissions.

Local Priorities and Challenges

West Dunbartonshire Council has no specific priorities in respect of local air quality beyond that of statutory monitoring, routine vehicle emission testing and idling engines enforcement.

How to Get Involved

Further information about air quality and related subjects can be obtained by visiting www.west-dunbarton.gov.uk/business/environmental-health/pollution/air-quality

Table of Contents

Executive Summary: Air Quality in Our Area	i
Air Quality in West Dunbartonshire Council	i
Actions to Improve Air Quality	i
Local Priorities and Challenges.....	ii
How to Get Involved.....	ii
1. Local Air Quality Management	1
2. Actions to Improve Air Quality	2
2.1 -Air Quality Management Areas.....	2
3. Air Quality Monitoring Data and Comparison with Air Quality Objectives	3
3.1 Summary of Monitoring Undertaken	3
3.1.1 Automatic Monitoring Sites	3
3.1.2 Non-Automatic Monitoring Sites	3
3.2 Individual pollutants.....	3
3.2.1 Nitrogen Dioxide (NO ₂)	3
3.2.2 Particulate Matter (PM ₁₀)	4
3.2.3 Particulate Matter (PM _{2.5}).....	5
3.2.4 Sulphur Dioxide (SO ₂).....	5
3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene	5
4. New Local Developments	6
4.1 Road Traffic Sources.....	6
4.2 Other Transport Sources	6
4.3 Industrial Sources.....	6
4.4 Commercial and Domestic Sources	6
4.5 New Developments with Fugitive or Uncontrolled Sources.....	6
5. Planning Applications	7

6. Conclusions and Proposed Actions.....	8
6.1 Conclusions from New Monitoring Data.....	8
6.2 Conclusions relating to New Local Developments	8
6.3 Proposed Actions	8
Appendix A: Monitoring Results	9
Appendix B: Full Monthly Diffusion Tube Results for 2015.....	23
Appendix C: Supporting Tech Info / Air Quality Monitoring Data QA/QC.....	26
Appendix D: Automatic monitor locations	32
Appendix E: NO₂ Diffusion tube locations and key	33
Appendix F: Graphs showing NO₂ trend.....	38
Glossary of Terms	41
References	42

List of Tables

Table 1.1 – Summary of Air Quality Objectives in Scotland	1
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1. Local Air Quality Management

This report provides an overview of air quality in West Dunbartonshire Council during 2016. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) 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 an exceedance is considered likely the local authority must 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. This Annual Progress Report (APR) summarises the work being undertaken by West Dunbartonshire Council to improve air quality and any progress that has been made.

Table 1.1 – Summary of Air Quality Objectives in Scotland

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Nitrogen dioxide (NO₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m ³	Annual mean	31.12.2005
Particulate Matter (PM₁₀)	50 µg/m ³ , not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	18 µg/m ³	Annual mean	31.12.2010
Particulate Matter (PM_{2.5})	10 µg/m ³	Annual mean	31.12.2020
Sulphur dioxide (SO₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
	266 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	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	10.0 mg/m^3	Running 8-Hour mean	31.12.2003
Lead	0.25 $\mu\text{g}/\text{m}^3$	Annual Mean	31.12.2008

2. Actions to Improve Air Quality

2.1 -Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12 months, setting out measures it intends to put in place in pursuit of the objectives.

There are no AQMAs within the West Dunbartonshire Council area.

3. Air Quality Monitoring Data and Comparison with Air Quality Objectives

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how local concentrations of the main air pollutants compare with the objectives.

West Dunbartonshire Council undertook automatic (continuous) monitoring at two sites during 2015. Table A.1 in Appendix A shows the details of the sites. National monitoring results are available at <http://www.scottishairquality.co.uk>

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

West Dunbartonshire Council undertook non- automatic (passive) monitoring of NO₂ at 24 sites during 2015. Table A.2 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix E. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

3.2 Individual pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for annualisation and bias. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

Only one of the monitored locations – Milton 1 - breached the National Air Quality Objective for NO₂ with a bias adjusted annual average of 44.3µg/m³.

This tube is located at the Dumbuck traffic light junction on the A82. The A82 is the main trunk road access to the West of Scotland and is the busiest road within the Council area.

The nearest receptors are residential properties located approximately 12 metres back from the kerb. An additional diffusion tube was placed in the front garden of one of the houses approximately 5 metres from the front façade to obtain data regarding NO₂ levels at the residences. The tube, designated Milton 2, has been at this site since 2008. The 2015 bias adjusted annual mean for Milton 2 was 15.02µg/m³.

The NO₂ Distance Calculator from the Air Quality Archive web site was used to predict NO₂ levels at the residences based on the results of Milton 1 diffusion tube. The calculator predicted the NO₂ levels at the residences to be 27.2µg/m³ which although higher than the Milton 2 diffusion tube result remains well within the National Air Quality Objective for NO₂. There is therefore no need to proceed to Detailed Assessment at this location.

Table A.3 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³. Trend graphs for NO₂ results, both automatic and diffusion tubes are included in Appendix F. The automatic monitors appear to show a very slight downward trend. It remains to be seen if this will continue. The diffusion tube results, on the whole, appear to follow this slight downward trend. However there are some exceptions. Graphs showing the trends in NO₂ levels for both automatic monitors and diffusion tubes can be found in Appendix F.

For diffusion tubes, the full 2015 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year. There were no exceedences of the National Air Quality Objectives at any site during 2015.

3.2.2 Particulate Matter (PM₁₀)

West Dunbartonshire Council recorded no exceedances of the National Air Quality Objectives for PM₁₀ during 2015.

Table A.5 in Appendix A compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past 5 years with the air quality objective of 18µg/m³.

Table A.6 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations for the past 5 years with the air quality objective of 50µg/m³, not to be exceeded more than 7 times per year.

We have insufficient data to discuss trends in PM levels as monitoring of PM₁₀ and PM_{2.5} began in March 2015 with the installation of a FIDAS monitor at West Dunbartonshire Clydebank.

3.2.3 Particulate Matter (PM_{2.5})

West Dunbartonshire Council did not record an exceedance of the National Air Quality Objectives for PM_{2.5} during 2015.

2015 was the first year West Dunbartonshire Council monitored PM_{2.5} therefore we have insufficient data to carry out any comparison from previous years.

3.2.4 Sulphur Dioxide (SO₂)

West Dunbartonshire Council does not monitor for sulphur dioxide.

3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene

West Dunbartonshire Council does not monitor for carbon monoxide, lead or 1,3 butadiene.

4. New Local Developments

4.1 Road Traffic Sources

There are no new road developments within the West Dunbartonshire Council area.

4.2 Other Transport Sources

There are no new transport sources within the West Dunbartonshire Council area.

4.3 Industrial Sources

There are no new industrial sources within the West Dunbartonshire Council area.

4.4 Commercial and Domestic Sources

There are no new commercial or domestic sources within the West Dunbartonshire Council area.

4.5 New Developments with Fugitive or Uncontrolled Sources

There are no new developments with fugitive or uncontrolled sources within the West Dunbartonshire Council area.

5. Planning Applications

In October 2015 a planning application was lodged for a development at Queens Quay, Clydebank. The application was for a mixed use development including residential (including affordable/community housing), retail, financial/service, restaurant, public house, office, hotel, care home , health centre, assembly and leisure uses, with associated car parking, access road, quay wall improvements and landscaping. An air quality assessment carried out by EnviroCentre dated October 2015, submitted in support of the application, concluded that there would be no significant change to NO_x and PM levels at relevant receptors as a result of the development.

6. Conclusions and Proposed Actions

6.1 Conclusions from New Monitoring Data

Monitoring of local air quality during 2015 has shown no exceedance of any of the National Air Quality Objectives at any relevant location.

6.2 Conclusions relating to New Local Developments

There was one major proposed development during 2015 which was considered to have the potential to adversely affect local air quality. The resultant air quality impact assessment report has shown that there will be no significant adverse effect on local air quality as a result of the proposed development.

6.3 Proposed Actions

Monitoring throughout 2015 has not identified any exceedance of the National Air Quality Objectives. No need to modify the existing monitoring programme has been identified.

West Dunbartonshire Council will therefore continue to monitor local air quality in accordance with its statutory duty and submit an Air Quality Progress Report in 2017.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
CM1	West Dunbartonshire Clydebank	Urban traffic	249723	672044	NO ₂ ; PM ₁₀ : PM _{2.5}	N	Chemiluminescent FIDAS	2.5	5	1.5
CM2	West Dunbartonshire Glasgow Road	Urban traffic	240238	675193	NO ₂	N	Chemiluminescent ML2014	18	4.5	1.5

(1) 0 if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

Table A.2 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?
DT1	Clydebank 1	Urban traffic	248479	671115	NO ₂	No	2	1	No
DT2	Clydebank 6	Urban traffic	249725	672069	NO ₂	No	40	1	No
DT3	Clydebank 7	Urban traffic	249913	669865	NO ₂	No	4	1	No
DT4	Clydebank 9	Urban traffic	248899	670784	NO ₂	No	3	1	No
DT5	Clydebank 10	Urban traffic	249759	671845	NO ₂	No	8.5	1	No
DT6	Clydebank 11	Urban traffic	249801	672288	NO ₂	No	22	1	No

West Dunbartonshire Council

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?
DT7	Clydebank 12	Urban traffic	249747	671665	NO ₂	No	10	1	No
DT8	Clydebank 13	Urban traffic	249762	671760	NO ₂	No	3.5	1	No
DT9	Clydebank 14	Urban traffic	249872	671854	NO ₂	No	>25	1	No
DT10	Clydebank 15	Urban traffic	249746	671966	NO ₂	No	8.5	1	No
DT11	Clydebank 16	Urban traffic	249967	672548	NO ₂	No	10	1	No
DT12	Clydebank 17	Urban traffic	249987	672440	NO ₂	No	11	1	No
DT13	Clydebank 18	Urban traffic	249929	6714454	NO ₂	No	9	1	No

West Dunbartonshire Council

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?
DT14	Milton 1	Urban traffic	242266	674235	NO ₂	No	12	1	No
DT15	Milton 2	Urban traffic	242160	674299	NO ₂	No	2	12	No
DT16	Dumbarton 1	Urban traffic	240322	657177	NO ₂	No	2.5	1	No
DT17	Dumbarton 11	Urban traffic	240515	675078	NO ₂	No	4	1	No
DT18	Dumbarton 12	Urban traffic	239410	675330	NO ₂	No	7	1	No
DT19	Glasgow Road, Dumbarton 2	Urban traffic	240178	675228	NO ₂	No	8	1	No
DT20	Glasgow Road, Dumbarton 3	Urban traffic	240279	675196	NO ₂	No	4.5	1	No

West Dunbartonshire Council

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?
DT21	Alexandria 1	Urban traffic	239024	680206	NO ₂	No	5	1	No
DT22	Balloch 1	Urban traffic	238584	681562	NO ₂	No	12	1	No
DT23	Briar Drive 1	Urban traffic	249723	672044	NO ₂	No	2.5	5	Yes
DT24	Briar Drive 2	Urban traffic	249723	672044	NO ₂	No	2.5	5	Yes
DT25	Briar Drive 3	Urban traffic	249723	672044	NO ₂	No	2.5	5	Yes
DT26	Dumbarton Triplicate 1	Urban traffic	240238	675193	NO ₂	No	18	4.5	Yes
DT27	Dumbarton Triplicate 2	Urban traffic	240238	675193	NO ₂	No	18	4.5	Yes

West Dunbartonshire Council

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?
DT28	Dumbarton Triplicate 3	Urban traffic	240238	675193	NO ₂	No	18	4.5	Yes
DT29	Vale of Leven 3	Urban traffic	240115	677146	NO ₂	No	>25	1	No
DT30	Vale of Leven 4	Urban traffic	204164	677014	NO ₂	No	>25	1	No

(1) 0 if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).

(2) N/A if not applicable.

Table A.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2015 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2011	2012	2013	2014	2015
CM1	Urban traffic	Automatic	96	96	19	22.9	25	21	18
CM2	Urban traffic	Automatic	96	96	21	24	19	17	17.1
DT1	Urban traffic	Diffusion Tube	91.6	91.6	32.8	30.9	32.9	25.0	26.82
DT2	Urban traffic	Diffusion Tube	91.6	91.6	31.9	36.2	35.9	29.3	23.99
DT3	Urban traffic	Diffusion Tube	91.6	91.6	30.9	28.9	30	27.4	21.44
DT4	Urban traffic	Diffusion Tube	100	100	28.9	25.3	25.8	19.7	19.96
DT5	Urban traffic	Diffusion Tube	91.6	91.6	29.1	27.9	28.9	21.7	24.32
DT6	Urban traffic	Diffusion Tube	100	100	28.3	25.0	22.9	20.1	19.07
DT7	Urban traffic	Diffusion Tube	91.6	91.6	24.1	26.2	25	19	17.78

West Dunbartonshire Council

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2015 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2011	2012	2013	2014	2015
DT8	Urban traffic	Diffusion Tube	100	100	27	25.2	27.3	20.9	21.37
DT9	Urban traffic	Diffusion Tube	91.6	91.6	16.8	17.2	15.9	13.1	12.28
DT10	Urban traffic	Diffusion Tube	91.6	91.6	24.3	28.4	28.0	22.9	24.25
DT11	Urban traffic	Diffusion Tube	91.6	91.6	29.2	22.9	25.8	21.8	23.11
DT12	Urban traffic	Diffusion Tube	91.6	91.6	30.9	25.4	23.5	21.3	21.09
DT13	Urban traffic	Diffusion Tube	83.3	83.3	28.4	29.4	26.1	22.22.1	20.57
DT14	Urban traffic	Diffusion Tube	100	100	51.6	51.7	54.8	40.0	44.30
DT15	Urban traffic	Diffusion Tube	91.6	91.6	28.8	21.1	25.7	18.6	15.02
DT16	Urban traffic	Diffusion Tube	91.6	91.6	26.1	27.9	29.2	25.8	24.56
DT17	Urban traffic	Diffusion Tube	91.6	91.6	35.2	33.9	29.2	28.1	24.07

West Dunbartonshire Council

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2015 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2011	2012	2013	2014	2015
DT18	Urban traffic	Diffusion Tube	100	100	21.7	20.5	20.5	15.3	14.77
DT19	Urban traffic	Diffusion Tube	100	100	31	34.6	32	24.1	25.87
DT20	Urban traffic	Diffusion Tube	83.3	83.3	33.3	32.6	31.3	28.8	24.34
DT21	Urban traffic	Diffusion Tube	100	100	29.0	25.7	26.6	28.1	23.33
DT22	Urban traffic	Diffusion Tube	100	100	23.5	24.6	24.0	19.6	16.05
DT23	Urban traffic	Diffusion Tube	100	100	20.4	23.9	24.6	20.1	17.91
DT24	Urban traffic	Diffusion Tube	100	100	26.5	25.2	22.9	20.2	18.19
DT25	Urban traffic	Diffusion Tube	100	100	22.9	26.9	32.2	21.0	19.22
DT26	Urban traffic	Diffusion Tube	91.6	91.6	22.1	20.3	20.3	16.9	15.72
DT27	Urban traffic	Diffusion Tube	91.6	91.6	22.3	23.3	20.5	16.5	17.6

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2015 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2011	2012	2013	2014	2015
DT28	Urban traffic	Diffusion Tube	91.6	91.6	22.6	21.1	20.9	17.6	15.47
DT29	Urban traffic	Diffusion Tube	91.6	83.3	25.1	23.1	24.8	19.7	19.03
DT30	Urban traffic	Diffusion Tube	100	100	28.1	22	23.3	20.7	24.49

Notes: Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG (16) if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.4 – 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2015 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾				
					2011	2012	2013	2014	2015
CM1	Urban traffic	Automatic	96	96	0	0	14(189)	0	0
CM2	Urban traffic	Automatic	96	96	0	0	4	0	0

Notes: Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/year) are shown in **bold**.

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 90%, the 99.8th percentile of 1-hour means is provided in brackets.

Table A.5 – Annual Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2015 (%) ⁽²⁾	PM ₁₀ Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2011	2012	2013	2014	2015
CM1	Urban traffic	78	78	N/A	N/A	N/A	N/A	10

Notes: Exceedances of the PM₁₀ annual mean objective of 18µg/m³ are shown in **bold**.

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been “annualised” as per LAQM.TG (16), valid data capture for the full calendar year is less than 75%.
See Appendix C for details.

Table A.6 – 24-Hour Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	PM ₁₀ 24-Hour Means > 50µg/m ³ (3)				
				2011	2012	2013	2014	2015
CM1	Urban traffic	78	78	N/A	N/A	N/A	N/A	0

Notes: Exceedances of the PM₁₀ 24-hour mean objective (50µg/m³ not to be exceeded more than 7 times/year) are shown in **bold**.

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 90%, the 90.4th percentile of 24-hour means is provided in brackets.

Table A.7 – Annual Mean PM_{2.5} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2015 (%) ⁽²⁾	PM _{2.5} Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2011	2012	2013	2014	2015
CM1	Urban traffic	77.5	77.5	N/A	N/A	N/A	N/A	6

Notes: Exceedances of the PM₁₀ annual mean objective of 10µg/m³ are shown in **bold**.

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been “annualised” as per LAQM.TG(16), valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Appendix B: Full Monthly Diffusion Tube Results for 2015

Table B.1 – NO₂ Monthly Diffusion Tube Results for 2015

Site ID	NO ₂ Mean Concentrations (µg/m ³)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted ⁽¹⁾
DT1	44.1		36.1		14.3	15.2	22.0	23.7	31.2	33.5	28.1	25.5	27.37	26.8
DT2	41.8	9.5	21	16.7	15.5	14.6	23.1	18.2		45.1	33.2	30.6	24.48	24.0
DT3	30	25.4	28.4	13.9	9.4	18.6	25.7	22	27.6		17.5	22.1	21.87	21.4
DT4	34.1	20.8	29.7	16	10.6	14.5	17.7	17.9	21.9	30.6	14.9	15.7	20.37	20.0
DT5	36.2	25.9	27.5	11.9		16.7	21.5	19.6	28.3	36.7	21.7	27.0	24.82	24.3
DT6	28.9	19.2	22.3	11.1	12.1	9.5	14.4	16.6	23.3	30.2	22.4	23.5	19.46	19.1
DT7	33	25.3	21.4	12.3	8.7	11.1		20.9	25.1	2.0	21.4	18.4	18.15	17.8
DT8	34.2	21.7	21.7	17	13.6	14.4	19.2	19.3	24.7	33.2	23.0	19.7	21.81	21.4
DT9	22.9	11.8	14.4	10.7	5.7	5.8	8.6		14.2	24.3	6.4	13	12.53	12.3

Site ID	NO ₂ Mean Concentrations (µg/m ³)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted ⁽¹⁾
DT10	33.1	23.6	25.0		14.3		16.8	10.4	31.9	37.1	36.0	19.3	24.75	24.3
DT11	38.3	33.3	28.5	17.7	12.1	12.6	18.1	21.6	27.4	32.8	17.6	23.0	23.58	23.1
DT12	30.1	26.4	21.1	13.2	9.7	14.0	16.2	22.5	22.4	34.8	27.8	20.1	21.53	21.1
DT13	38.6	19.8	26.3	17.7	7.2	14.5	16.4	20.7	27.7				20.99	20.6
DT14	69.7	51.4	27.9	14.5	19.8	41.3	48	43.2	61.7	59.9	57.5	47.5	45.2	44.3
DT15	27.8	19.5	23.5	11.6	8.4	12.5	14.2	14.3	16.6	2	22	11.5	15.33	15.0
DT16	19	16.4	18.6	18.3	17.8	25.7	25.3		43.1	36.3	36.9	18.2	25.06	24.6
DT17	30.1	26.4	21.1	13.2	9.7	14	16.2	22.5	22.4	34.8	27.8	20.1	21.53	21.1
DT18	33.1	11.4	13.8	8.6	10.1	8.8	10.9	12.5	17.2	29.3	15	10.2	15.08	14.8
DT19	40.3	23.7	11.2	20.9	16.9	16.1	28.6	24.8	37.7	44.3	21.8	30.5	26.4	25.9
DT20	43.8	22.2	29.8	10.7	10.1	21.6		28.2		45.7	14.1	22.2	24.84	24.3

Site ID	NO ₂ Mean Concentrations (µg/m ³)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted ⁽¹⁾
DT21	27.4	32.5	28.0	19.4	11.6	15.1	21.0	23.1	29.1	31.6	24.9	22.0	23.81	23.3
DT22	11.1	12.6	12.0	16.6	7.6	11.0	15.3	19.8	26.3	27.2	20.7	16.3	16.38	16.0
DT23	25.2	12.9	22.1	11.8	7.1	8.5	18.6	16.9	18.6	33.9	18.8	24.9	18.28	17.9
DT24	31.6	16.8	17.7	14.9	7.1	7.9	13.2	15.5	18.1	45.8	22.0	21.1	18.56	18.2
DT25	30.1	21.4	24.0	9.5	9.1	7.8	15.7	24.8	16.9	43.2	20.6	12.2	19.61	19.2
DT26	28.4	13.2	14.6	11.0	9.3	9.9	14.6	11.0	20.7	27.4	16.4		16.05	15.7
DT27	53.5	14.8	13.7	9.9	6.9	9.4	17.4	9.6	20.7	27.5	14.2		17.96	17.6
DT28	28.3	11.3	12.7	13.8	6.0	11.1	14.8	9.7	24.3	28.3	13.3		15.78	15.5
DT29	24.6		13.8	12.8	4.8	15.3	18.0	18.5	28.5	30.8	30.9	15.6	19.42	19.0
DT30	71.8	17.8	14.0	17.2	12.4	17.9	19.9	23.0	29.1	35.7	21.1	20.0	24.99	24.5

(1) See Appendix C for details on bias adjustment

Appendix C: Supporting Tech Info / Air Quality Monitoring Data QA/QC

Automatic monitors

Data from West Dunbartonshire Council automatic monitors is downloaded daily by AEA. The data is screened, scaled and ratified by AEA and a full report is provided for each calendar year.

Additionally AEA carry out an audit of all automatic monitors twice yearly. Both the Glasgow Road, Dumbarton and the West Dunbartonshire, Clydebank air quality units have a comprehensive service contract and are serviced by Enviro Technology Services plc and Horiba respectively at 6 monthly intervals.

West Dunbartonshire Council staff change filters and carry out manual calibration of the NO_x analysers on a fortnightly basis. The calibration data is forwarded to AEA for QA/QC purposes.

Since moving to new office accommodation in March 2015 we no longer have the facility to monitor the West Dunbartonshire Clydebank unit on a daily basis. We do not have the necessary software to remotely monitor West Dunbartonshire Glasgow Road. We therefore rely on Ricardo/AEA informing us of any problems at both units.

NO₂ Tubes

West Dunbartonshire Council use Glasgow Scientific Services (GSS) for NO₂ tube analysis. Tubes are provided and analysed by GSS.

The NO₂ tube preparation method used is 20% triethanolamine (TEA) in water.

Glasgow Scientific Services participate in the AIR NO₂ Proficiency Testing Scheme. In 2015 100% of the results the lab submitted to the scheme were determined to be satisfactory based on a z-score of $\leq \pm 2$.

A bias of 0.98 has been used to adjust NO₂ tube data. The bias was obtained from the National Diffusion Tube Bias Adjustment Factor Spreadsheet.

- Produced by Ricardo Energy and Environment on behalf of the Scottish Government
- WEST DUNBARTONSHIRE CLYDEBANK
- 01 January to 31 December 2015
- These data have been fully ratified by Ricardo Energy and Environment

Pollutant	PM ₁₀₊	PM _{25~}	NO ₂	NO _x
Maximum hourly mean	96 µg m ⁻³	73 µg m ⁻³	145 µg m ⁻³	876 µg m ⁻³
Maximum daily mean	-	34 µg m ⁻³	75 µg m ⁻³	277 µg m ⁻³
98.08th percentile of daily means	26 µg m ⁻³	22 µg m ⁻³	-	-
Average	10 µg m ⁻³	6 µg m ⁻³	18 µg m ⁻³	39 µg m ⁻³
Data capture	78.0 %	77.5 %	95.6 %	95.6 %

- + PM₁₀ instruments:
- FIDAS using a gravimetric factor of 1 from 13 March 2015 onwards
- ~ PM₂₅ as measured by a FIDAS
- All gaseous pollutant mass units are at 20'C and 1013mb. Particulate matter concentrations are reported at ambient temperature and pressure.
- NO_x mass units are NO_x as NO₂ µg m⁻³

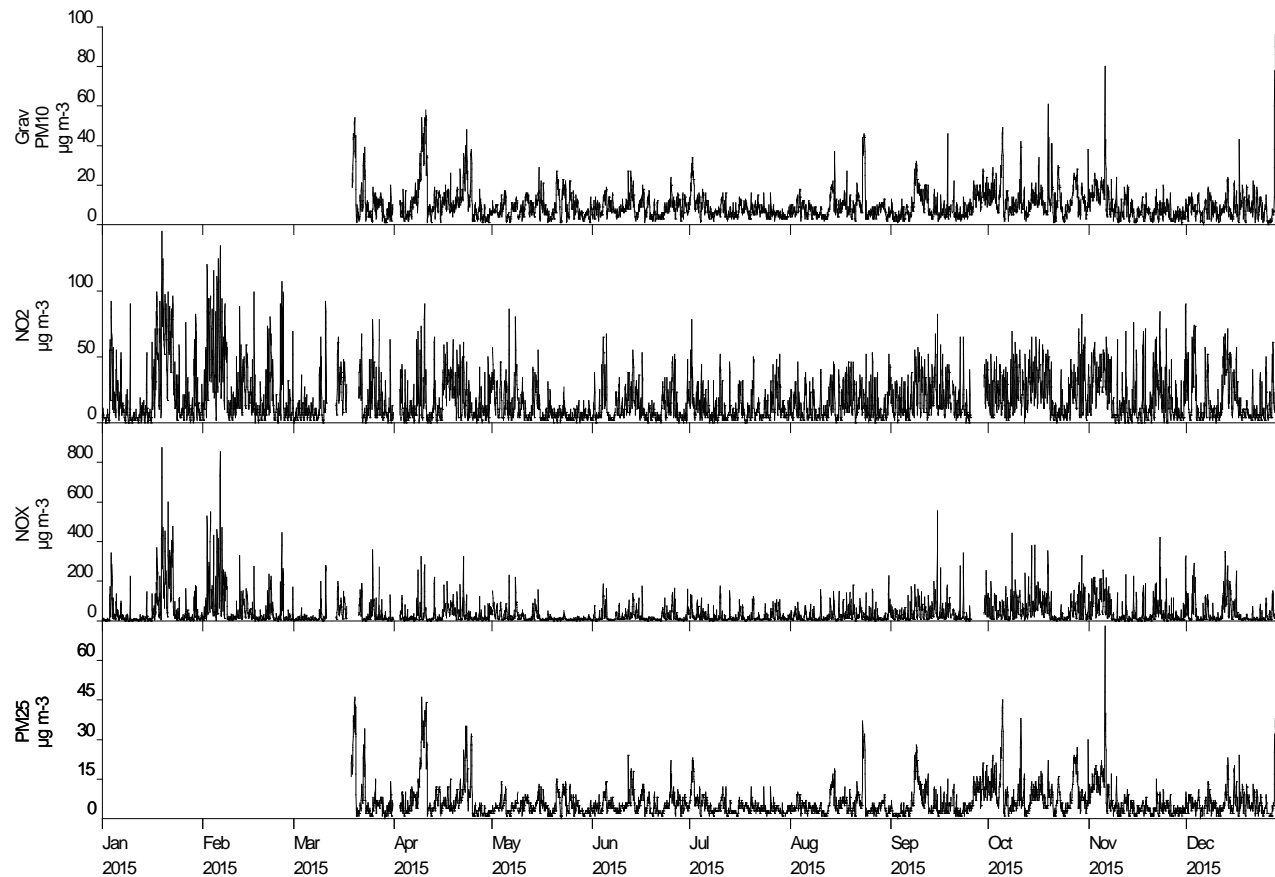
Pollutant	Air Quality Regulations (2000) and Air Quality (Scotland) Amendment Regulations 2002	Exceedances	Days
PM ₁₀ Particulate Matter (Gravimetric)	Daily mean > 50 µg m ⁻³	0	0
PM ₁₀ Particulate Matter (Gravimetric)	Annual mean > 18 µg m ⁻³	0	-
Nitrogen Dioxide	Annual mean > 40 µg m ⁻³	0	-
Nitrogen Dioxide	Hourly mean > 200 µg m ⁻³	0	0

- Note: For a strict comparison against the objectives there must be a data capture of >90% throughout the calendar year

Produced by Ricardo Energy and Environment on behalf of the Scottish Government

West Dunbartonshire Clydebank

Hourly Mean Data for 01 January to 31 December 2015



Dumbarton Roadside

01/01/2015 to 31/12/2015

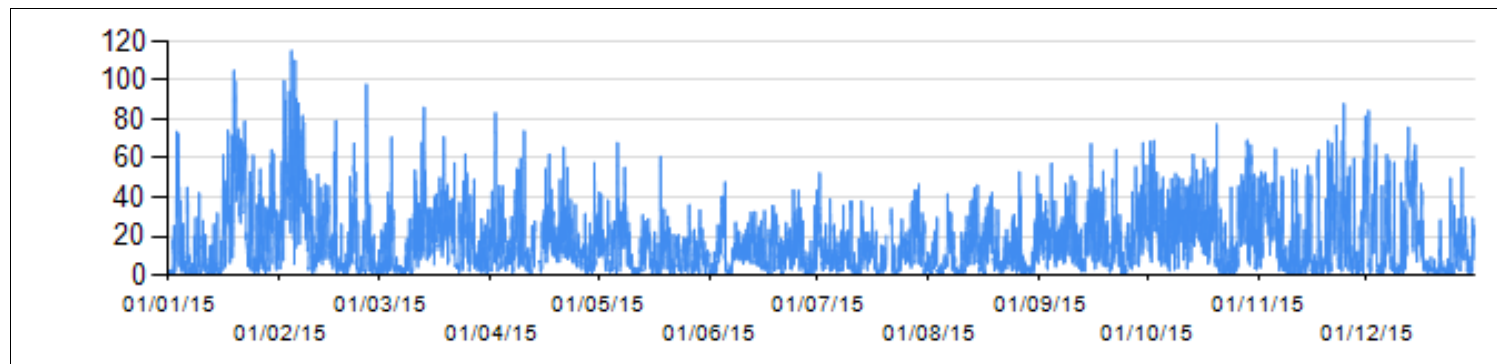
	V High (No. of Days)	High (No. of Days)	Mod (No. of Days)	Low (No. of Days)	Max. Hourly Conc.	Max. Daily Conc.	Max. Running 8 Hour Mean	Max. Running 24 Hour Mean	Period Mean Conc	Period Data Capture (%)
NO2 ($\mu\text{g}/\text{m}^3$)	0	0	0	365	115.2	62.2	77.3	67.4	17.1	95.8
NOX ($\mu\text{g}/\text{m}^3$)	0	0	0	0	594.3	200.4	290.7	213.3	36.7	95.8

- These data have been fully ratified by Ricardo Energy and Environment

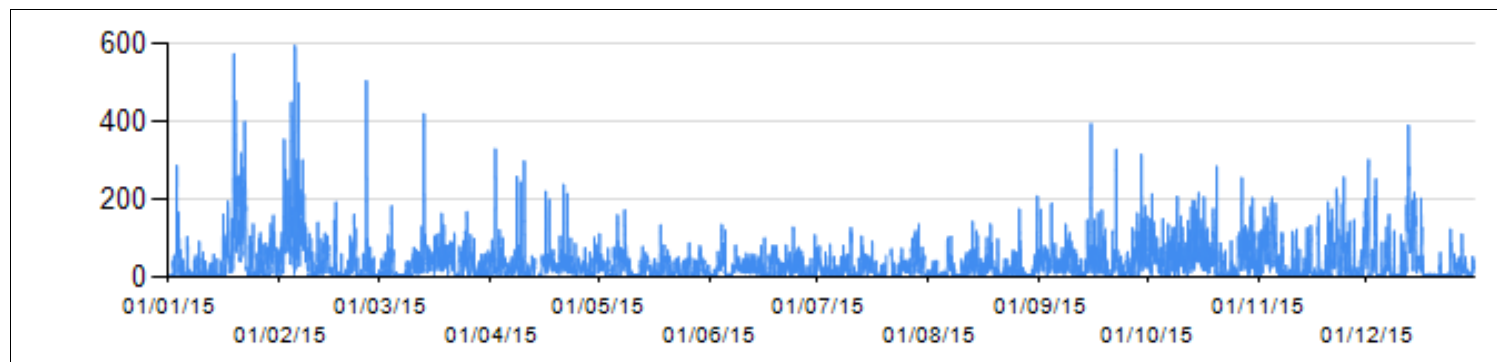
	Air Quality Objective	Exceedances	Days
NO2	Hourly mean > 200 $\mu\text{g}/\text{m}^3$	None	0
NO2	Period mean > annual mean obj 40 $\mu\text{g}/\text{m}^3$	No	

Note: When comparing site measurements against the air quality objectives data capture should meet or exceed 90% across a calendar year.

NO₂



NO_x



Appendix D: Automatic monitor locations

West Dunbartonshire Clydebank Automatic Monitor Location (CM1)

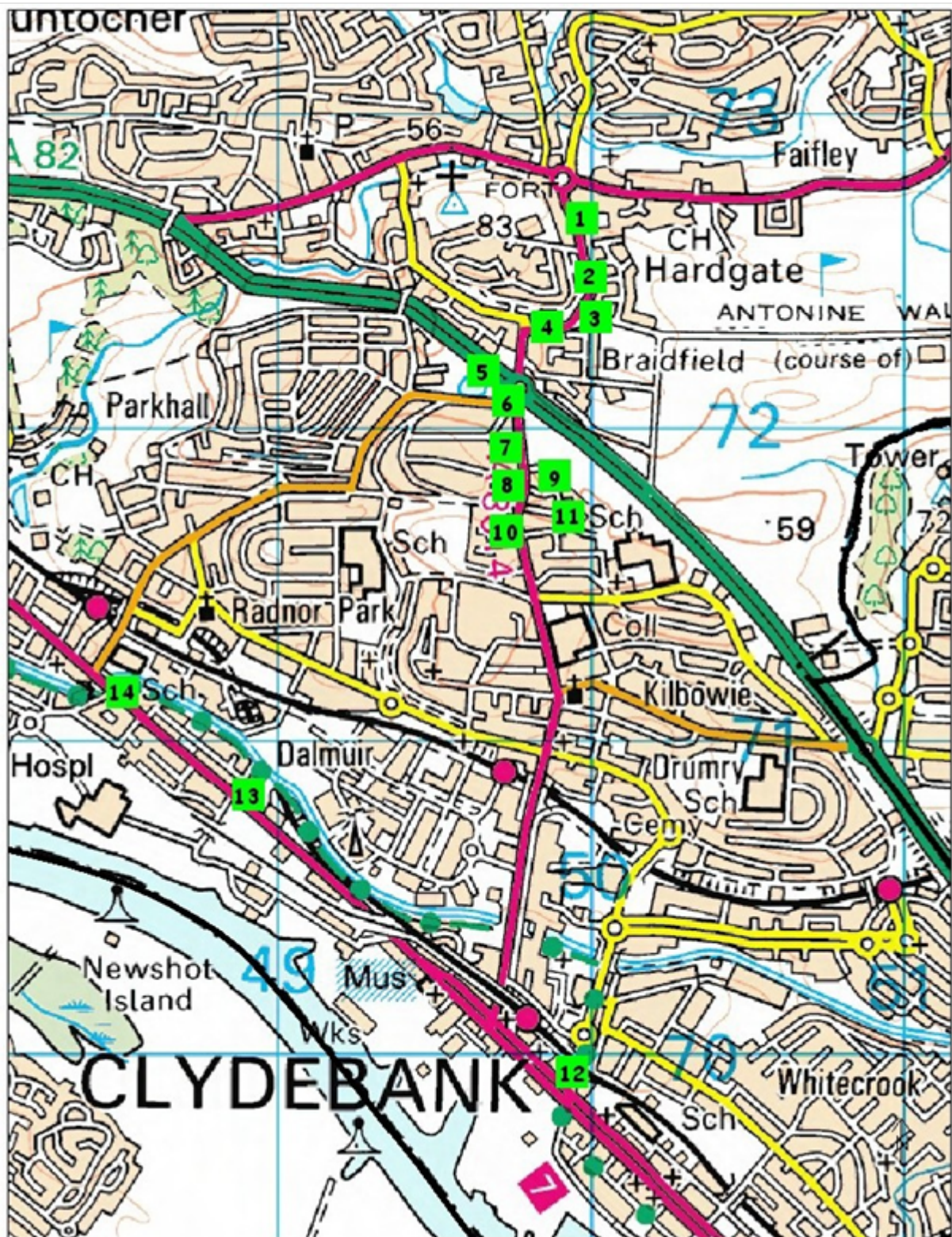


Dumbarton Roadside Automatic Monitor Location (CM2)



Appendix E: NO₂ Diffusion tube locations and key

Clydebank



Dumbarton



West Dunbartonshire Council

Title: - N02 Map - Dumbarton

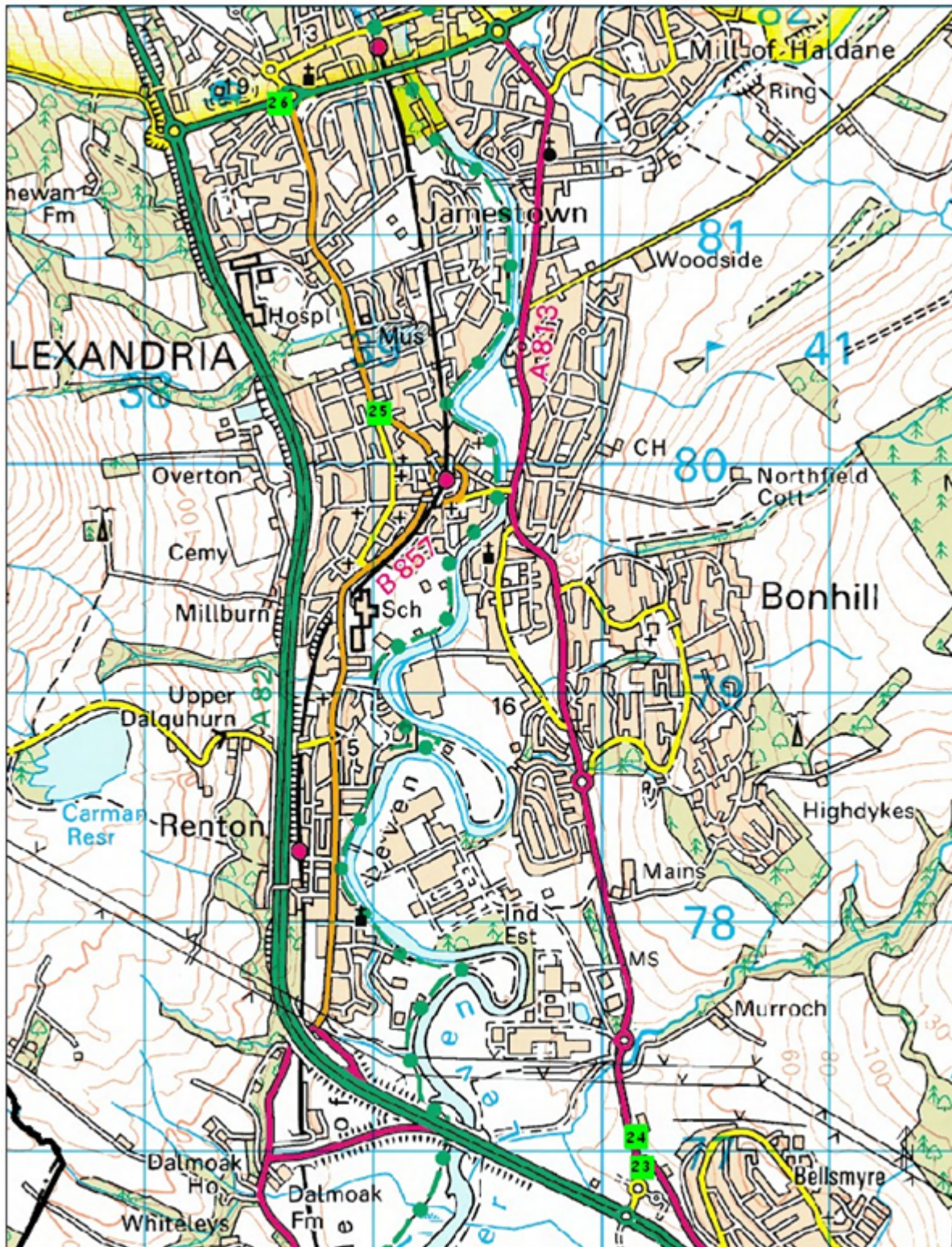
Date: 05/04/2012

Scale: 1:15000

Map Reference: NS4075

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Vale of Leven



Title : N02 Map - Vale of Leven

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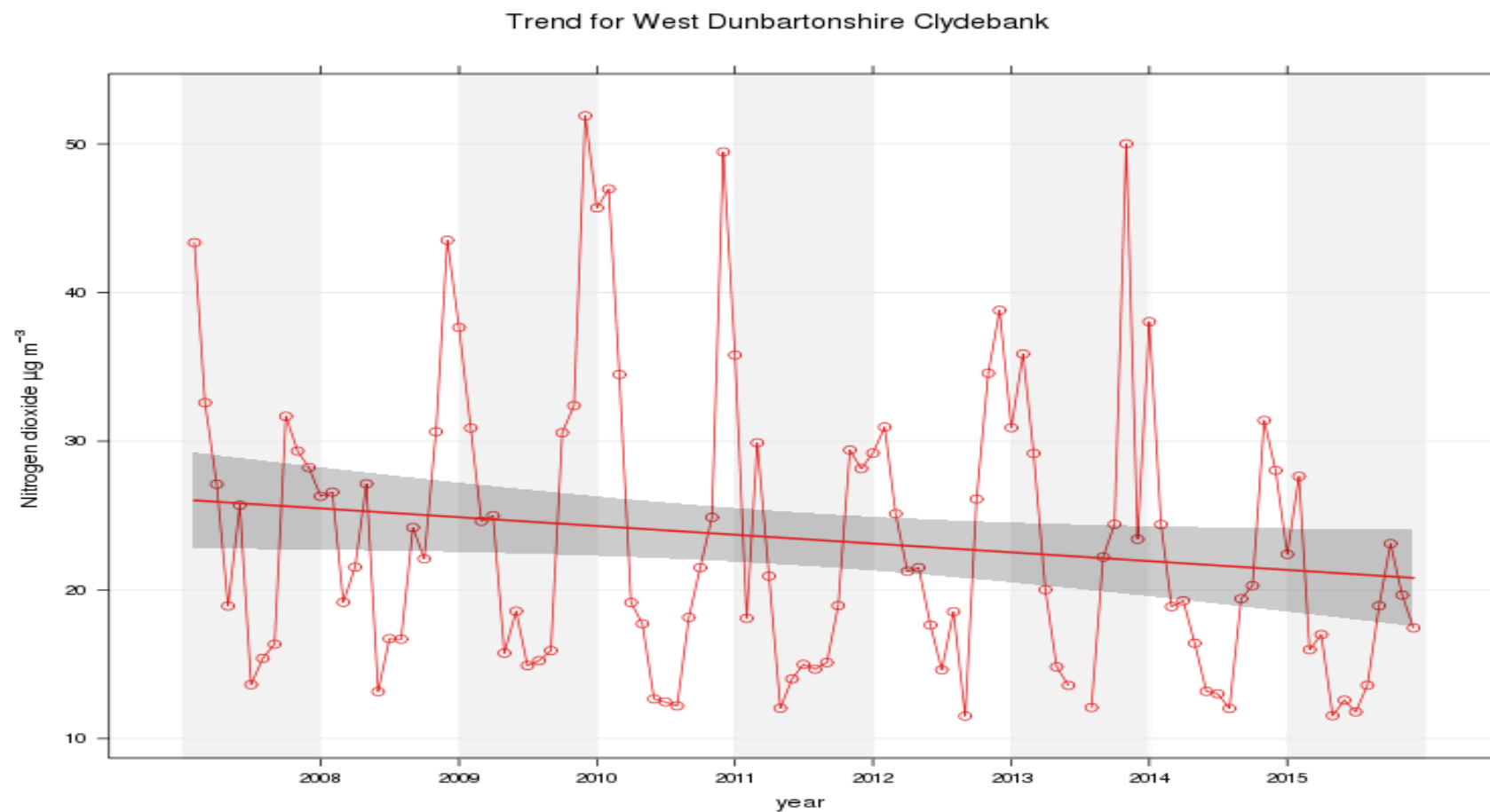
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Date : 05/04/2012

Key for NO₂ diffusion tube monitoring locations

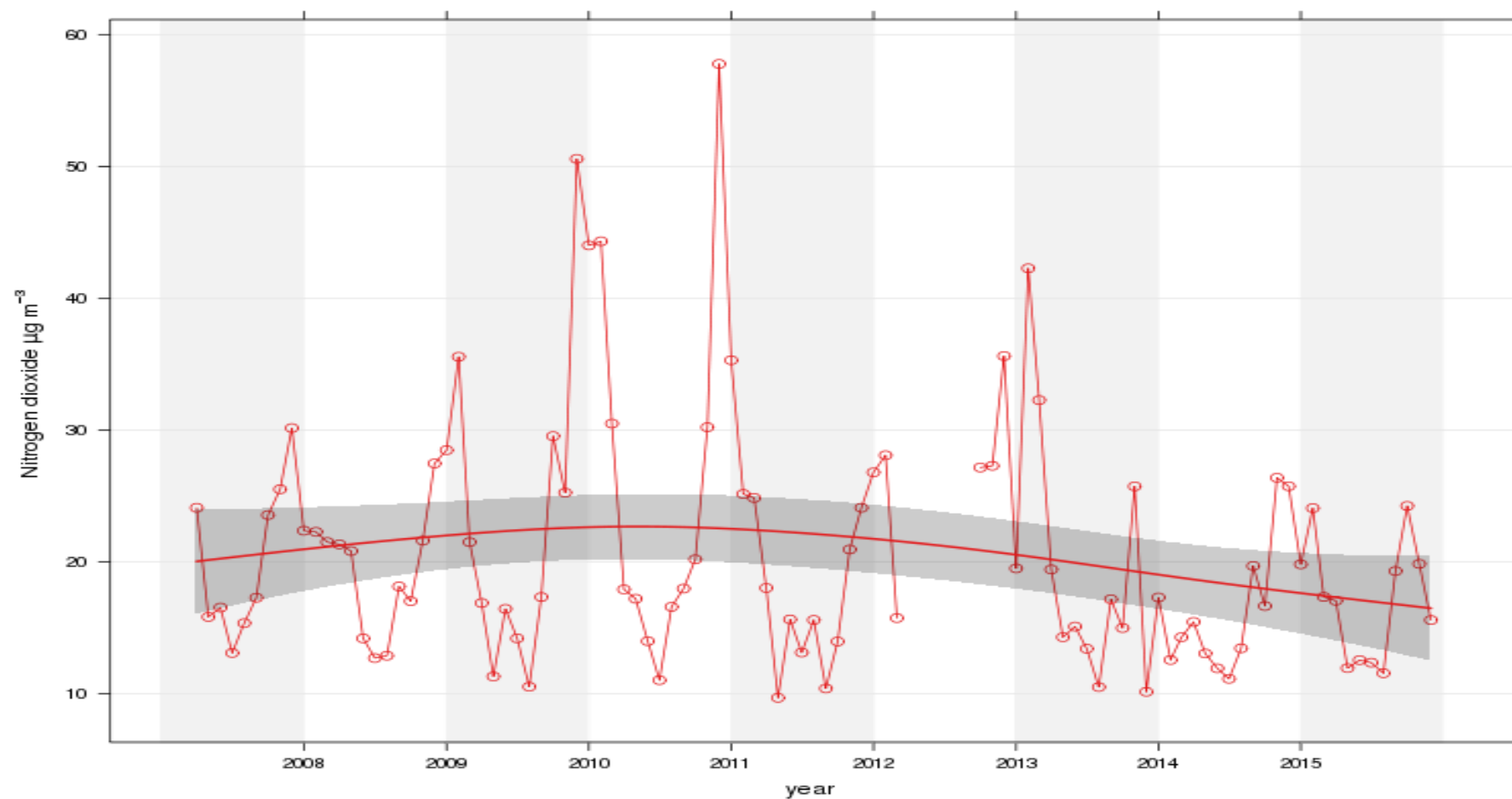
Map Number	Site ID	Name of site
1	DT11	Clydebank 16
2	DT12	Clydebank 17
3	DT13	Clydebank 18
4	DT6	Clydebank 11
5	DT2	Clydebank 6
6	DT23-25	West Dunbartonshire Clydebank Co-located
7	DT10	Clydebank 15
8	DT8	Clydebank 13
9	DT5	Clydebank 10
10	DT7	Clydebank 12
11	DT9	Clydebank 14
12	DT3	Clydebank 7
13	DT4	Clydebank 9
14	DT1	Clydebank 1
15	DT14	Milton 1
16	DT15	Milton 2
17	DT17	Dumbarton 11
18	DT20	Glasgow Road Dumbarton 3

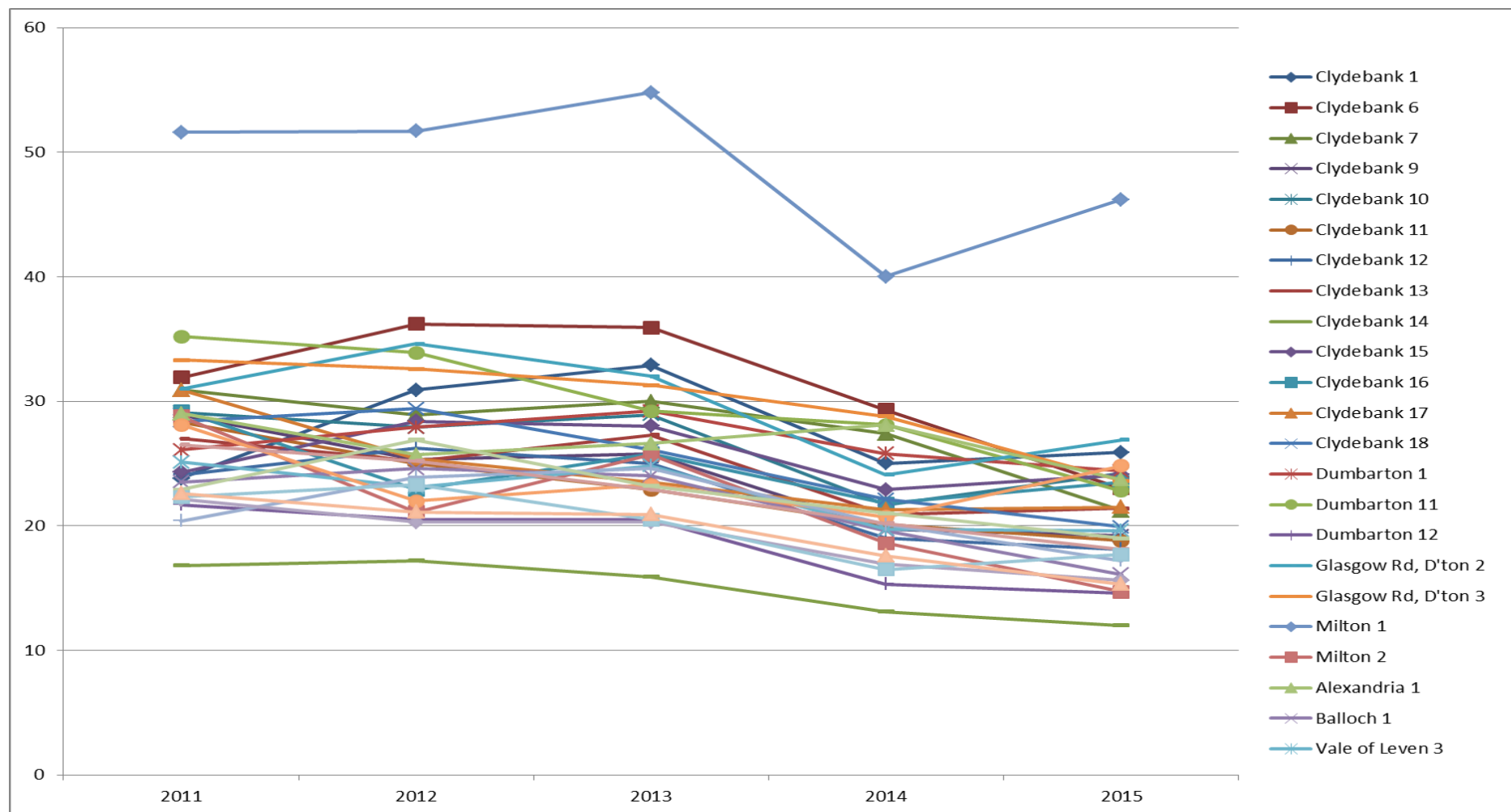
West Dunbartonshire Council

Map Number	Site ID	Name of site
19	DT26-28	West Dunbartonshire Glasgow Road. Co-located
20	DT19	Glasgow Road, Dumbarton 2
21	DT16	Dumbarton 1
22	DT18	Dumbarton 12
23	DT30	Vale of Leven 4
24	DT29	Vale of Leven 3
25	DT21	Alexandria 1
26	DT22	Balloch 1

Appendix F: Graphs showing NO₂ trend

Trend for West Dunbartonshire Glasgow Road



NO₂ diffusion tube trend 2011 - 2015

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide

References

Local Air Quality Management Technical Guidance TG (16)

Local Air Quality Policy Guidance PG(S) (16)

The Environment Act 1995 and Regulations made thereunder

West Dunbartonshire Council Update and Screening Assessment 2015

The Road Traffic (Vehicle Emissions) (Fixed Penalty) (Scotland) Regulations 2003.