

Annual Progress Report (APR)



2018 Air Quality Annual Progress Report (APR) for
West Dunbartonshire Council

In fulfilment of Part IV of the
Environment Act 1995

Local Air Quality Management

June 2018

West Dunbartonshire Council

Local Authority Officer	Pat Hoey
Department	Corporate Services
Address	16 Church Street, Dumbarton
Telephone	0141 951 9759
E-mail	Environmental.health@west-dunbarton.gov.uk
Report Reference number	APR/18/1
Date	June 2018

Executive Summary: Air Quality in Our Area

Air Quality in West Dunbartonshire Council

Local air quality within the West Dunbartonshire Council area remains generally satisfactory.

No Air Quality Management Areas have been declared within the Council Area.

West Dunbartonshire Council has two automatic air quality monitoring stations. The first, West Dunbartonshire Clydebank, is located at Briar Drive in Clydebank and monitors Nitrogen Dioxide (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 and is part of the Automatic Urban and Rural Network (AURN). Both automatic units have triplicate co-located NO₂ diffusion tubes.

During 2017 we also monitored NO₂ (passive diffusion tubes) at 29 locations (excluding co-located triplicates) throughout the West Dunbartonshire Council area.

Monitoring carried out during 2017 did not identify any exceedances of National Air Quality Objectives for NO₂, PM₁₀ or PM_{2.5}.

No significant changes in emission sources within the Council area were identified during 2017.

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

There were 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.

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

During 2017 one vehicle emission testing date took place. 181 cars were stopped and tested. In total, 2 vehicles failed the emission test and fixed penalty notices were issued to the drivers of the vehicles. Following consultation with the Scottish Government West Dunbartonshire Council will no longer carry out roadside vehicle emission testing but will concentrate on regular idling engines patrols with emphasis being placed on schools, taxi ranks and bus termini in addition to responding to complaints.

Local Priorities and Challenges

West Dunbartonshire Council has no specific priorities in respect of local air quality beyond that of statutory monitoring and idling engines enforcement. However it is hoped, should staffing resources permit, during 2018 we will work with schools to highlight and educate with regard to local air quality.

How to Get Involved

Further information about air quality and related subjects can be obtained by visiting

[http://www.west-dunbarton.gov.uk/business/environmental-health/pollution/air-
quality/#Air pollution](http://www.west-dunbarton.gov.uk/business/environmental-health/pollution/air-quality/#Air%20pollution)

Table of Contents

Executive Summary: Air Quality in Our Area	iii
1. Local Air Quality Management	1
2. Actions to Improve Air Quality	3
2.1 Air Quality Management Areas.....	3
3. Air Quality Monitoring Data and Comparison with Air Quality Objectives	4
3.1 Summary of Monitoring Undertaken	4
3.1.1 Automatic Monitoring Sites	4
3.1.2 Non-Automatic Monitoring Sites.....	4
3.1.3 Non-Automatic Monitoring Sites.....	5
3.2 Individual pollutants.....	5
3.2.1 Nitrogen Dioxide (NO ₂).....	5
3.2.2 Particulate Matter (PM ₁₀).....	6
3.2.3 Particulate Matter (PM _{2.5})	6
3.2.4 Sulphur Dioxide (SO ₂)	6
3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene	6
4. New Local Developments	7
4.1 Road Traffic Sources.....	7
4.2 Other Transport Sources	7
4.3 Industrial Sources.....	7
4.4 Commercial and Domestic Sources	7
4.5 New Developments with Fugitive or Uncontrolled Sources.....	7
5. Planning Applications	8
6. Conclusions and Proposed Actions	9
6.1 Conclusions from New Monitoring Data.....	9
6.2 Conclusions relating to New Local Developments	9

6.3 Proposed Actions	9
Glossary of Terms	41
References	42
Appendices	
Appendix A: Monitoring Results	10
Appendix B: Full Monthly Diffusion Tube Results for 2017.....	27
Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC	32
Appendix D: Automatic Monitoring Site Location Maps co-located NO2 tubes	34
Appendix E: Automatic Monitor trends 2010 -2017	39
List of Tables	
Table 1.1 – Summary of Air Quality Objectives in Scotland	1
Table A.1 – Details of Automatic Monitoring Sites	10
Table A.2 – Details of Non-Automatic Monitoring Sites	11
Table A.3 – Annual Mean NO₂ Monitoring Results	17
Table A.4 – 1-Hour Mean NO₂ Monitoring Results	23
Table A.5 – Annual Mean PM₁₀ Monitoring Results	24
Table A.6 – 24-Hour Mean PM₁₀ Monitoring Results.....	25
Table A.7 – Annual Mean PM_{2.5} Monitoring Results	26
Table B.1 – NO₂ Monthly Diffusion Tube Results for 2017.....	27

1. Local Air Quality Management

This report provides an overview of air quality in West Dunbartonshire Council during 2017. 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 (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m ³	Annual mean	31.12.2005
Particulate Matter (PM ₁₀)	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 (SO ₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004

West Dunbartonshire Council

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	3.25 µg/m ³	Running annual mean	31.12.2010
1,3 Butadiene	2.25 µg/m ³	Running annual mean	31.12.2003
Carbon Monoxide	10.0 mg/m ³	Running 8-Hour mean	31.12.2003
Lead	0.25 µg/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.

West Dunbartonshire Council currently does not have any AQMAs.

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 2 sites during 2017. [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 29 sites (excluding co-located triplicate tubes) during 2017. [Table A.2](#) in Appendix A shows the details of the sites.

Our 2017 APR presented the proposal by Renfrewshire Council to construct a new bridge over the river Clyde which would touchdown within the West Dunbartonshire Council area. As a result of this proposal four new NO₂ tubes (Clydebank 19, 20, 21 & 22) were deployed on the main road to and from the proposed touchdown area. This would supplement the information available from the existing diffusion tube at Argyll Road (DT3). The diffusion tube results for all four indicate no exceedance of the national air quality objective during 2017.

Three new NO₂ tubes (DT 33 – 35) were located at the site of a new proposed junction on the A82 at Milton as discussed in the 2017 APR. There was a degree of uncertainty as to the where the new junction would be located. This meant that the

three tubes were not in place until June 2017. The results have therefore been annualised. (Details of the annualisation are included in Appendix C.) Two of the tubes (Milton 3 & 4) are located within 0.5 metres of the A82 trunk road, the third (Milton 5) is located at Crannog Court which is the nearest residential premises to the proposed junction. Crannog Court is located 14 metres from the A82. Milton 3 and 4 breached the National Air Quality Objectives for NO₂ with bias adjusted, annualised results of 56.8µg/m³ and 56.3µg/m³ respectively. The bias adjusted, annualised result for Milton 5 was 25.9µg/m³. As a comparison the NO₂ fall off with distance calculator was used and the estimated NO₂ level at Milton 5 was 27.9 µg/m³ which while marginally higher was still well within the National Air Quality Objective.

3.1.3 Non-Automatic Monitoring Sites

Maps showing the location of the monitoring sites are provided in Appendix D. 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)

None of the monitored locations breach the NO₂ National Air Quality Objective during 2017.

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.

For diffusion tubes, the full 2017 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. Neither automatic monitoring site

exceeded that National Air Quality Objective during 2017. The highest diffusion tube result was $49\mu\text{g}/\text{m}^3$.

3.2.2 Particulate Matter (PM₁₀)

West Dunbartonshire Council recorded no exceedance of the National Air Quality Objective for PM₁₀ in 2017. The annual mean was $9\mu\text{g}/\text{m}^3$ which is the same as 2016. A trend graph is included in Appendix E which shows a very slight downward trend but there remains insufficient data to be sure.

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 $18\mu\text{g}/\text{m}^3$.

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 $50\mu\text{g}/\text{m}^3$, not to be exceeded more than 7 times per year.

3.2.3 Particulate Matter (PM_{2.5})

West Dunbartonshire Council recorded no exceedance of the National Air Quality Objective for PM_{2.5}. The annual average for 2017 was $5\mu\text{g}/\text{m}^3$ which is a slight reduction from the 2016 result of $6\mu\text{g}/\text{m}^3$. A trend chart is included in Appendix E. However as we have only been monitoring since 2015 there may not be sufficient data to have confidence in this trend.

Table A.7 in Appendix A compares the ratified and adjusted monitored PM_{2.5} annual mean concentrations for the past 5 years with the air quality objective of $10\mu\text{g}/\text{m}^3$.

3.2.4 Sulphur Dioxide (SO₂)

West Dunbartonshire Council does not monitor 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

There are two new proposed developments which may possibly impact on local air quality.

The first is a residential development of a former council owned site in Clydebank. It is proposed to build 126 houses and flats. An Air Quality Impact Assessment has been requested.

The second is a proposed leisure/tourist development in Balloch including hotel, bunkhouse accommodation, self-catering holiday lodges; self catering boathouse accommodation; residential development; leisure and recreational facilities. The consultation process is ongoing at the time of writing this report.

4.1 Road Traffic Sources

There are no new traffic sources identified within the West Dunbartonshire Council area

4.2 Other Transport Sources

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

4.3 Industrial Sources

There are no new industrial sources identified 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

Apart from the proposed developments discussed above there have been no new planning applications granted which may have an effect on local air quality

6. Conclusions and Proposed Actions

6.1 Conclusions from New Monitoring Data

Monitoring of local air quality during 2017 has shown no exceedance of the National Air Quality Objectives at any relevant location.

6.2 Conclusions relating to New Local Developments

There are no new local developments which require consideration in this report.

6.3 Proposed Actions

Monitoring throughout 2017 did not identify any exceedance on the National Air Quality Objective. However proposed developments have been identified which may have a future impact on local air quality. The progress of these developments will be monitored and necessary alterations/additions to the diffusion tube network duly considered.

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	Roadside	249723	672044	NO ₂ ; PM ₁₀ PM _{2.5}	N	Chemiluminescent; FIDAS	18	4.5	1.5
CM2	West Dunbartonshire Glasgow Road	Roadside	240238	675193	NO ₂	N	Chemiluminescent	2.5	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	Roadside	248479	671115	NO ₂	No	2	<1	No
DT2	Clydebank 6	Kerbside	249725	672069	NO ₂	No	40	<1	No
DT3	Clydebank 7	Kerbside	249913	669865	NO ₂	No	4	<1	No
DT4	Clydebank 9	Kerbside	248899	670784	NO ₂	No	3	<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?
DT5	Clydebank 10	Kerbside	249759	671845	NO ₂	No	8.5	<1	No
DT6	Clydebank 11	Kerbside	249801	672288	NO ₂	No	22	<1	No
DT7	Clydebank 12	Kerbside	249747	671665	NO ₂	No	10	<1	No
DT8	Clydebank 13	Kerbside	249762	671760	NO ₂	No	3.5	<1	No
DT9	Clydebank 14	Roadside	249872	671854	NO ₂	No	>25	10	No
DT10	Clydebank 15	Kerbside	249746	671966	NO ₂	No	8.5	<1	No
DT11	Clydebank 16	Kerbside	249967	672548	NO ₂	No	10	<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?
DT12	Clydebank 17	Kerbside	249987	672440	NO ₂	No	11	<1	No
DT13	Dumbarton 1	Roadside	240322	675177	NO ₂	No	2.5	2.5	No
DT14	Dumbarton 11	Kerbside	240515	675078	NO ₂	No	4	<1	No
DT15	Dumbarton 12	Kerbside	239410	675330	NO ₂	No	7	<1	No
DT16	Glasgow Rd, D'ton 2	Kerbside	240178	675228	NO ₂	No	8	<1	No
DT17	Glasgow Rd, D'ton 3	Kerbside	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?
DT18	Milton 1	Kerbside	242266	674235	NO ₂	No	12	<1	No
DT19	Milton 2	Roadside	242160	674299	NO ₂	No	2	12	No
DT20	Alexandria 1	Kerbside	239024	680206	NO ₂	No	5	<1	No
DT21	Balloch 1	Kerbside	238584	681562	NO ₂	No	12	<1	No
DT22	Briar Drive 1	Roadside	249723	672044	NO ₂	No	2.5	5	Yes
DT23	Briar Drive 2	Roadside	249723	672044	NO ₂	No	2.5	5	Yes
DT24	Briar Drive 3	Roadside	249723	672044	NO ₂	No	2.5	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?
DT25	Dumbarton triplicate 1	Roadside	240238	675193	NO ₂	No	18	4.5	Yes
DT26	Dumbarton triplicate 2	Roadside	240238	675193	NO ₂	No	18	4.5	Yes
DT27	Dumbarton triplicate 3	Roadside	240238	675193	NO ₂	No	18	4.5	Yes
DT28	East Thompson St	Kerbside	249972	671448	NO ₂	No	13	<1	No
DT29	Clydebank 19	Kerbside	249844	669919	NO ₂	No	6	<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?
DT30	Clydebank 20	Roadside	250098	669677	NO ₂	No	9.5	2	No
DT31	Clydebank 21	Kerbside	250531	669269	NO ₂	No	20	<1	No
DT32	Clydebank 22	Kerbside	250199	669551	NO ₂	No	4	<1	No
DT33	Milton 3	Kerbside	242378	674258	NO ₂	No	21	<1	No
DT34	Milton 4	Kerbside	242421	674270	NO ₂	No	12	<1	No
DT35	Milton 5	Roadside	242413	674288	NO ₂	No	2	14	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 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2013	2014	2015	2016	2017
CM1	Roadside	Automatic	98.9	98.9	25	21	18	22	19
CM2	Roadside	Automatic	100	79.8	19	17	17.1	21	20
DT1	Roadside	Diffusion tube	91	91	32.9	25	26.82	23.1	23.8
DT2	Kerbside	Diffusion tube	100	100	35.9	29.3	23.99	26.8	28.4
DT3	Kerbside	Diffusion tube	100	100	30	27.4	21.44	22.7	23.7
DT4	Kerbside	Diffusion tube	100	100	25.8	19.7	19.96	18.7	19.7

West Dunbartonshire Council

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2013	2014	2015	2016	2017
DT5	Kerbside	Diffusion tube	100	100	28.9	21.7	24.32	22.0	23.4
DT6	Kerbside	Diffusion tube	100	100	22.9	20.1	19.07	21	18.9
DT7	Kerbside	Diffusion tube	91	91	25	19	17.78	21.1	23.1
DT8	Kerbside	Diffusion tube	100	100	27.3	20.9	21.37	21	21.4
DT9	Roadside	Diffusion tube	91	91	15.9	13.1	12.28	13.8	13.5
DT10	Kerbside	Diffusion tube	100	100	28	22.9	24.25	18.6	22.0
DT11	Kerbside	Diffusion tube	100	100	25.8	21.8	23.11	19.6	20.5

West Dunbartonshire Council

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2013	2014	2015	2016	2017
DT12	Kerbside	Diffusion tube	100	100	23.5	21.3	21.09	17.7	21.0
DT13	Roadside	Diffusion tube	100	100	29.2	25.8	24.56	25.3	23.3
DT14	Kerbside	Diffusion tube	100	100	29.2	28.1	24.07	23.2	22.9
DT15	Kerbside	Diffusion tube	50	50	20.5	15.3	14.77	17.8	16.6
DT16	Kerbside	Diffusion tube	100	100	32	24.1	25.87	25.5	25.7
DT17	Kerbside	Diffusion tube	100	100	31.3	28.8	24.34	23.5	21.0
DT18	Kerbside	Diffusion tube	100	100	51.7	54.8	40	44.3	47.1

West Dunbartonshire Council

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2013	2014	2015	2016	2017
DT19	Roadside	Diffusion tube	91	91	25.7	18.6	15.02	16	18.7
DT20	Kerbside	Diffusion tube	91	91	26.6	28.1	23.33	23.6	23.5
DT21	Kerbside	Diffusion tube	100	100	24	19.6	16.05	19.6	22.8
DT22	Roadside	Diffusion tube	100	100	24.6	20.1	17.91	19.1	20.5
DT23	Roadside	Diffusion tube	100	100	22.9	20.2	18.19	20.6	20.7
DT24	Roadside	Diffusion tube	100	100	32.2	21	19.22	20.2	21.6
DT25	Roadside	Diffusion tube	100	100	20.3	16.9	15.72	17.4	16.4

West Dunbartonshire Council

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2013	2014	2015	2016	2017
DT26	Roadside	Diffusion tube	91	91	20.5	16.5	17.6	17	20.6
DT27	Roadside	Diffusion tube	100	100	20.9	17.6	15.47	16.5	18.0
DT28	Kerbside	Diffusion tube	100	100				18.4	18.1
DT29	Kerbside	Diffusion tube	91.6	91.6					21.3
DT30	Roadside	Diffusion tube	100	100					27.1
DT31	Kerbside	Diffusion tube	100	100					21.0
DT32	Kerbside	Diffusion tube	100	100					19.3

West Dunbartonshire Council

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2013	2014	2015	2016	2017
DT33	Kerbside	Diffusion tube	58	58					49.0
DT34	Kerbside	Diffusion tube	58	58					48.5
DT35	Roadside	Diffusion tube	50	50					22.4

Notes: EDT18xceedences 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 2017 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾				
					2013	2014	2015	2016	2017
CM1	Roadside	Automatic	98.9	98.9	14(189)	0	0	0	0
CM2	Roadside	Automatic	79.8	79.8	4	0	0	0(106)	0(101)

Notes: Exceedences 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 85%, 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 2017 (%) ⁽²⁾	PM ₁₀ Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2013	2014	2015	2016	2017
CM1	Roadside	99.8	99.8	N/A	N/A	10	9	9

Notes: Exceedences 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 2017 (%) (2)	PM ₁₀ 24-Hour Means > 50µg/m ³ (3)				
				2013	2014	2015	2016	2017
CM1	Roadside	99.8	99.8	N/A	N/A	0	No data	0

Notes: Exceedences 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 85%, the 98.1st 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 2017 (%) ⁽²⁾	PM _{2.5} Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2013	2014	2015	2016	2017
CM1	Roadside	99.87	95			6	6	5

Notes: Exceedences 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 2017

Table B.1 – NO₂ Monthly Diffusion Tube Results for 2017

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	40.1	31.7	43.6	16	1.6	19.6	16.5	22.8		12.7	36	46.8	26.1	23.8
DT2	49.7	23.4	33.4	21.4	32.5	15.6	22.6	23	31.5	19.9	42.3	59.1	31.2	28.4
DT3	41.7	18.1	31.6	21.4	17.4	17.5	17.9	22.4	26.8	13.8	39.7	44.6	26.1	23.7
DT4	35.2	26.8	2	21	40.5	16.9	12.6	14.5	19.6	12.6	26.9	30.6	21.6	19.7
DT5	41.7	25.4	25.3	12.7	18.1	12.5	19.5	22.9	26.1	19.4	38.6	46.5	25.7	23.4
DT6	31.8	18.4	17	14.5	14.2	14.3	14.5	15.7	27.8	14	29.3	37.4	20.7	18.9

West Dunbartonshire Council

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)
DT7	36.5	23.2	25.8		18.3	14.8	15.1	21.8	25.4	14.8	38.2	45	25.4	23.1
DT8	36.8	25.4	34	2	12.7	14.7	14.6	16.8	25.3	16.8	38.4	44.2	23.5	21.4
DT9	23	15.4	16.4	6.6	9.2	9.3	7.4	9.9	35.7	5.2	25.6		14.9	13.5
DT10	42.7	25.3	30.1	11.5	18.7	13.8	16	17.4	22.4	14.1	34.1	43.7	24.2	22.0
DT11	34.2	17.4	17.9	20.3	15.3	14.1	15.8	17.6	23.7	14	40.7	39.4	22.5	20.5
DT12	31.6	17.8	17.8	12.5	15.1	13.8	14.1	18.5	25.4	21	43.6	45.4	23.1	21.0
DT13	37.4	29.7	26.6	2	17.8	25.8	13.4	25.8	26.9	16.2	45.2	40	25.6	23.3
DT14	36.2	25	26.2	25	17.4	14.5	12.3	14.3	23	11.1	48.5	48.2	25.1	22.9

West Dunbartonshire Council

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)
DT15	27	20.3	22.4	13.9	17.1	11.1	5.7	13.2	17.6	9.2	27.3	34.6	18.3	16.6
DT16	48.3	33.7		29.3	1.6	16.8	20.2	18.5	23.3	21	39.4	59.1	28.3	25.7
DT17		23.3	14.9	2	17.3	30.7		31.9	34.2	20.6	53.8	2	23.1	21.0
DT18	56.5	52.6	57.2	57	41.7	48.7	43.8	47	56.7	35	60.3	65.2	51.8	47.1
DT19	25.4	20.3	23.4	23.6	11	15	12.9	15.8	22.1		26.4	29.7	20.5	18.7
DT20	39.5	26.7	35.7	19.2	14.2	19.5	16.6	20.7	25.4	17.3	33	41.8	25.8	23.5
DT21	63.5	23.2	27.4	21.7	20.9	13.7	17.1	17.1	24.4	7.7	28.2	35.3	25.0	22.8
DT22	37.5	24.6	26.3	15.5	17	10.8	15.9	14.9	25.6	9.3	32.8	40.3	22.5	20.5

West Dunbartonshire Council

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)
DT23	31.4	28.6	26.2	17.4	28.6	10	14.5	16.9	17.7	10.7	30.8	40	22.7	20.7
DT24	34.6	25.5	26.4	15.6	38.2	14	14.8	16.2	22.6	9.1	31.1	36.4	23.7	21.6
DT25	30.6	19.3	26.8	14	16.9	6.4	12.8	12.8	19.7	13.4		25.5	18.0	16.4
DT26	28.9	22.5	23.9	14.2	24.4	12.7	13.9	14.9	33.1	15.9	44.3	23.4	22.7	20.6
DT27	32.1	23.9	25.8	13.6	16.9	12.8	13.1	14.9	20.3	2.1	38.5	23.4	19.8	18.0
DT28	22.2	32.9	22.5	18.1	14.2	11.2	10.3	8.4	21.4	9.8	31.1	36.1	19.9	18.1
DT29	40.9	24.6	24	14.2	13.4	13.4	14.6		24.8	11.8	36.5	39.2	23.4	21.3
DT30	40.9	27.8	37.6	17.8	58.6	2	17.7	17.3	40	15.2	37.4	45.5	29.8	27.1

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)
DT31	31.9		45.4	2	22.4	12.1	15.3	16.6	21.6	12.6	33.5	41	23.1	21.0
DT32	37.4	26.3	30.1	18.9	18.4	7.8	12.9	14.5	17.3	8.7	28.3	34.3	21.2	19.3
DT33						47.6	45.6	47.6	67	30.7	72.4	66.3	53.9	49.0
DT34						64.8	16.5	68.9	44.4	36.7	62.2	79.5	53.3	48.5
DT35						20.4	41.3	19.4	20.9	14		31.9	24.7	22.4

(1) See Appendix C for details on bias adjustment

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

During 2017 data from West Dunbartonshire Council automatic monitors was downloaded daily by AEA. The data was screened, scaled and ratified by AEA and an annual report provided. Both of the automatic monitors have a comprehensive service contract and are serviced at six monthly intervals. West Dunbartonshire Glasgow Rd, Dumbarton is serviced by Enviro Technology and West Dunbartonshire Clydebank by Horiba (NOx unit) and Air Monitors (FIDAS).

The full Air Pollution Report for 2017 produced by Ricardo Energy and Environment for West Dunbartonshire Glasgow Road (site ID WDB4) and West Dunbartonshire Clydebank (site ID WDB3) can be accessed at <http://www.scottishairquality.co.uk>.

Annualisation of NO₂ data for 2017

Site	% Data Capture	AM	PM	Ra
Glasgow Anderston	86	22	21.3	1.03
Glasgow Townhead	99	25	25	1
Glasgow W/millglen	93	9	6.5	1.384
Bush Estate	97.8	5	4.03	1.2
Total Ra				1.16

Milton 3 NO₂ period mean = 49 x 1.16 = 56.8µg/m³

Milton 4 NO₂ period mean = 48.5 x 1.16 = 56.2µg/m³

Milton 5 NO₂ period mean – 22.4 x x1.16 = 25.9 µg/m³

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 2017 the results the lab submitted to the scheme were determined to be satisfactory based on a z-score of ≤±2.

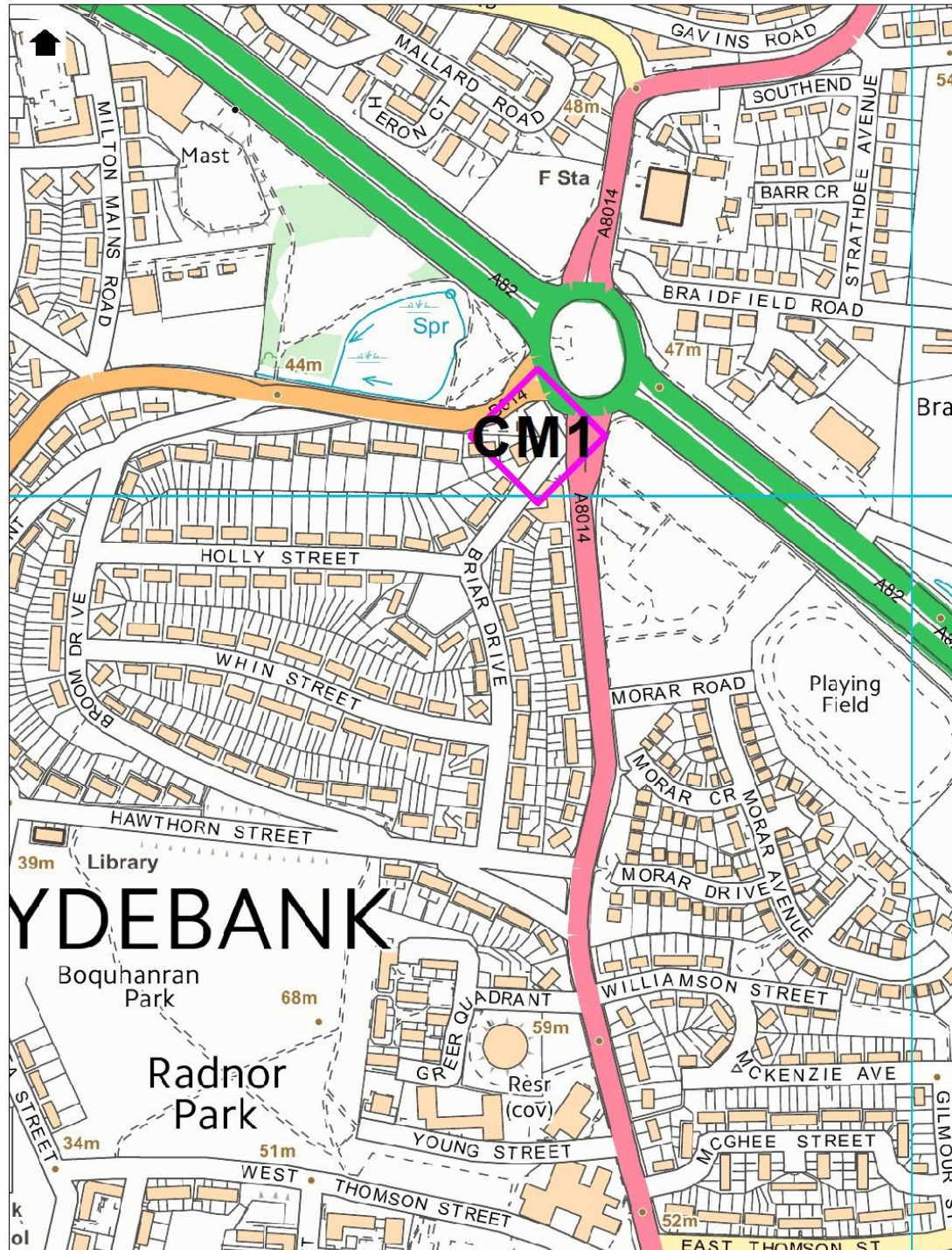
A bias of 0.91 has been used to adjust NO₂ tube data. The bias was obtained from the National Diffusion Tube Bias Adjustment Factor spreadsheet.

Appendix D: Automatic Monitoring Site Location Maps co-located NO₂ tubes

West Dunbartonshire Council

Title: West Dunbartonshire Clydebank & DT22,23 & 24

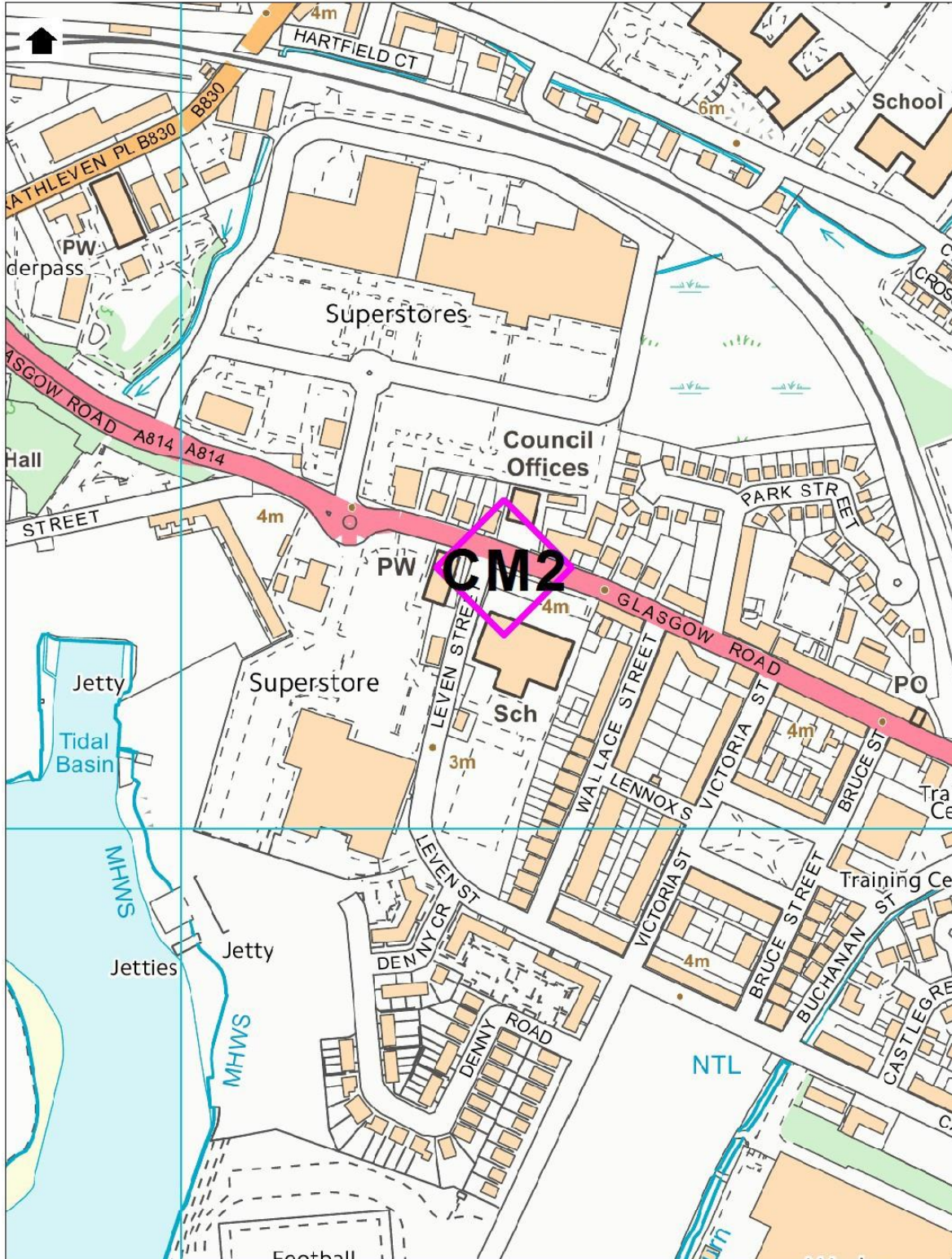
Map No : Map Ref: NS4971NE Reproduced by permission of Ordnance Survey on behalf of HMSO.
Date : 14/06/2017 Scale : 1:2500 (C) Crown copyright and database right 2015. All rights reserved.
West Dunbartonshire OS Licence Number 100020790.



West Dunbartonshire Council

Title: West Dunbartonshire Glasgow Rd & DT25,26 & 27

Map No : Map Ref. NS4075SW Reproduced by permission of Ordnance Survey on behalf of HMSO.
Date : 14/06/2017 Scale : 1:2500 (C) Crown copyright and database right 2015. All rights reserved.
West Dunbartonshire OS Licence Number 100020790.



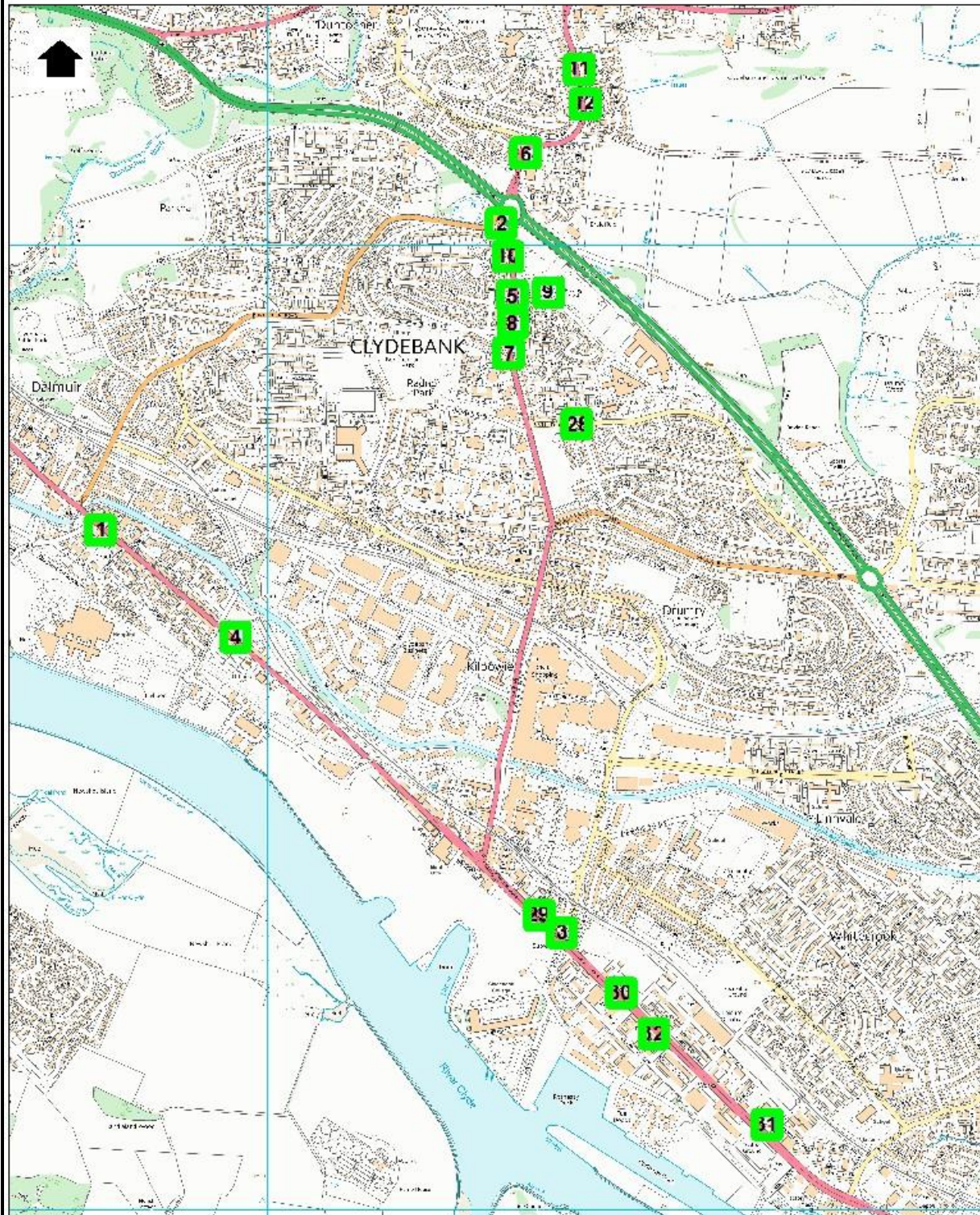
West Dunbartonshire Council

Title: Clydebank NO2

Map No : Map Ref. NS5069

Date : 12/06/2018 Scale : 1:15000

Reproduced by permission of Ordnance Survey on behalf of HMSO
(C) Crown copyright and database right 2015. All rights reserved.
West Dunbartonshire OS Licence Number 100020790.



West Dunbartonshire Council

Title : Dumbarton N02

Map Ref : NS4074 Map No :
Date : 22/06/2018 Scale : 1:12500

Reproduced by permission of Ordnance Survey on behalf of HSMO (C) Crown Copyright and database right 2015. All rights reserved. West Dunbartonshire Council Licence No. 100020790.

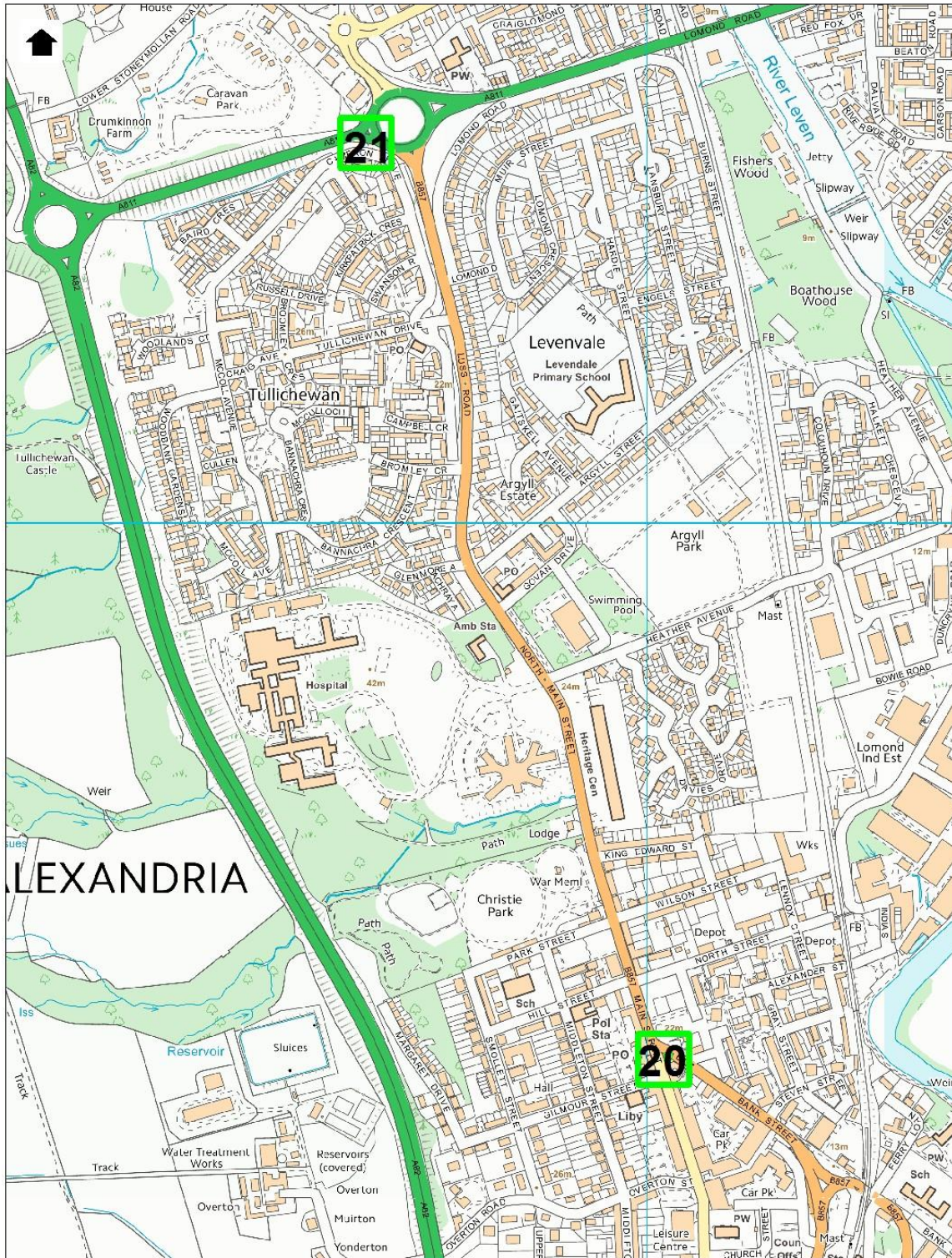


West Dunbartonshire Council

Title: Vale of Leven NO2

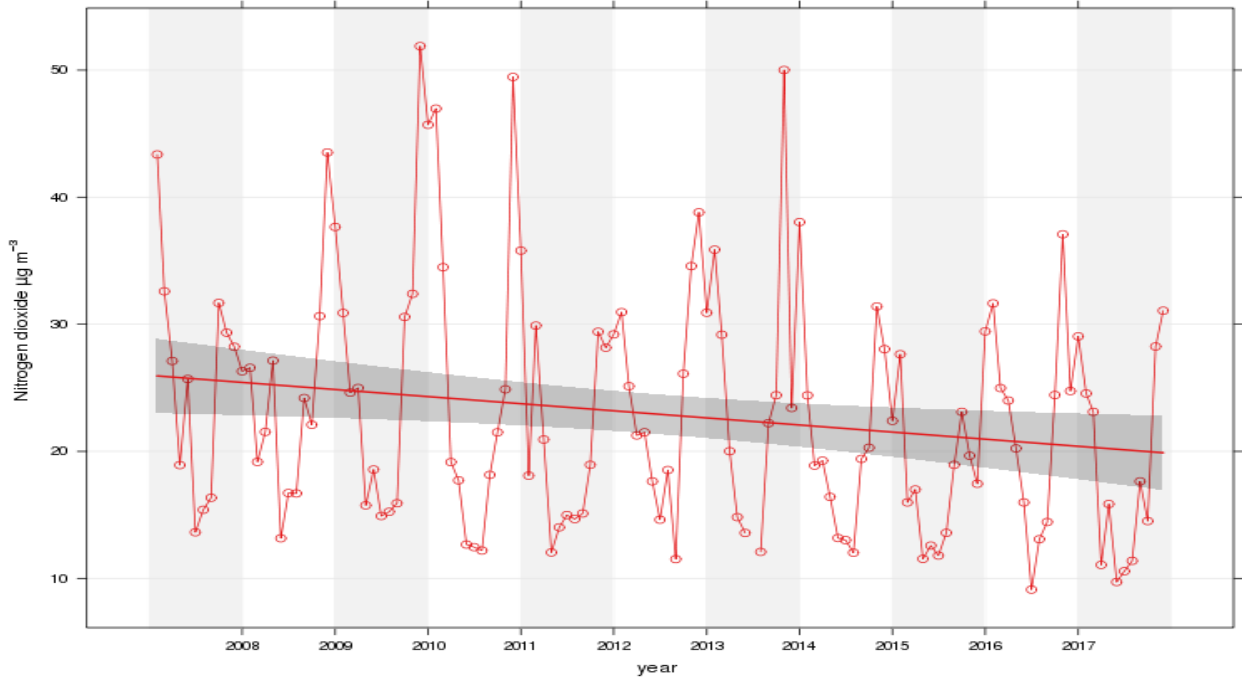
Map No: Map Ref: NS3880
Date: 14/06/2017 Scale: 1:5000

Reproduced by permission of Ordnance Survey on behalf of HMSO.
(C) Crown copyright and database right 2015. All rights reserved.
West Dunbartonshire OS Licence Number 100020790.

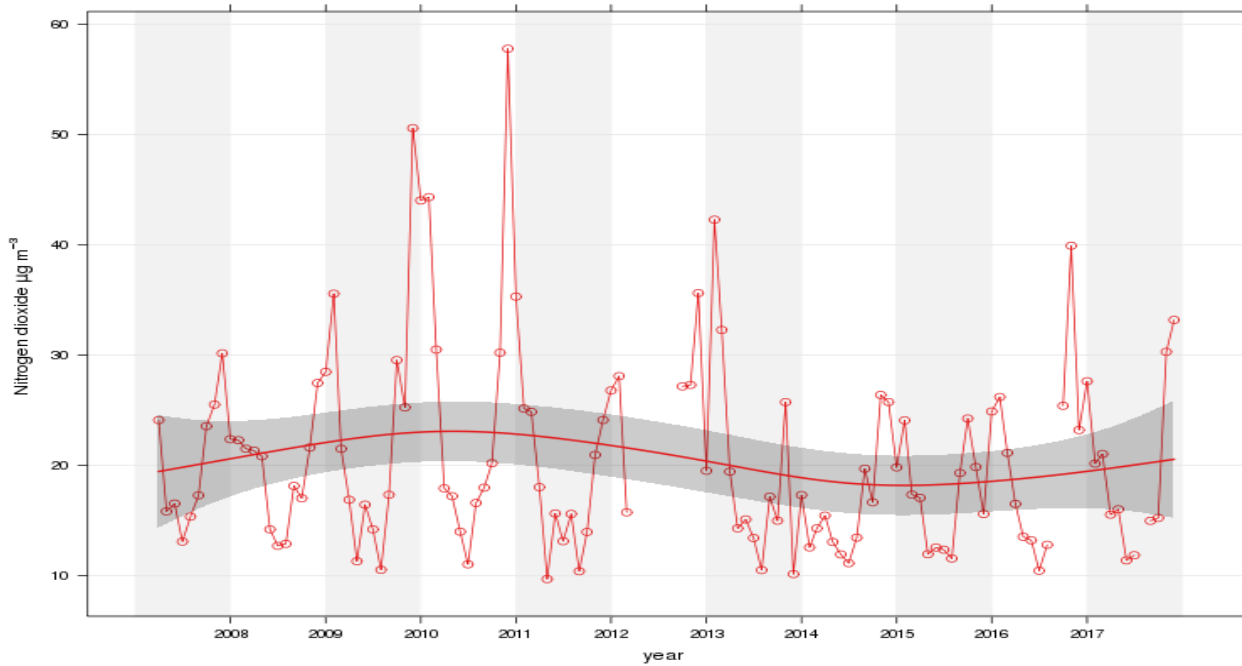


Appendix E: Automatic Monitor trends 2010 -2017

Trend for West Dunbartonshire Clydebank

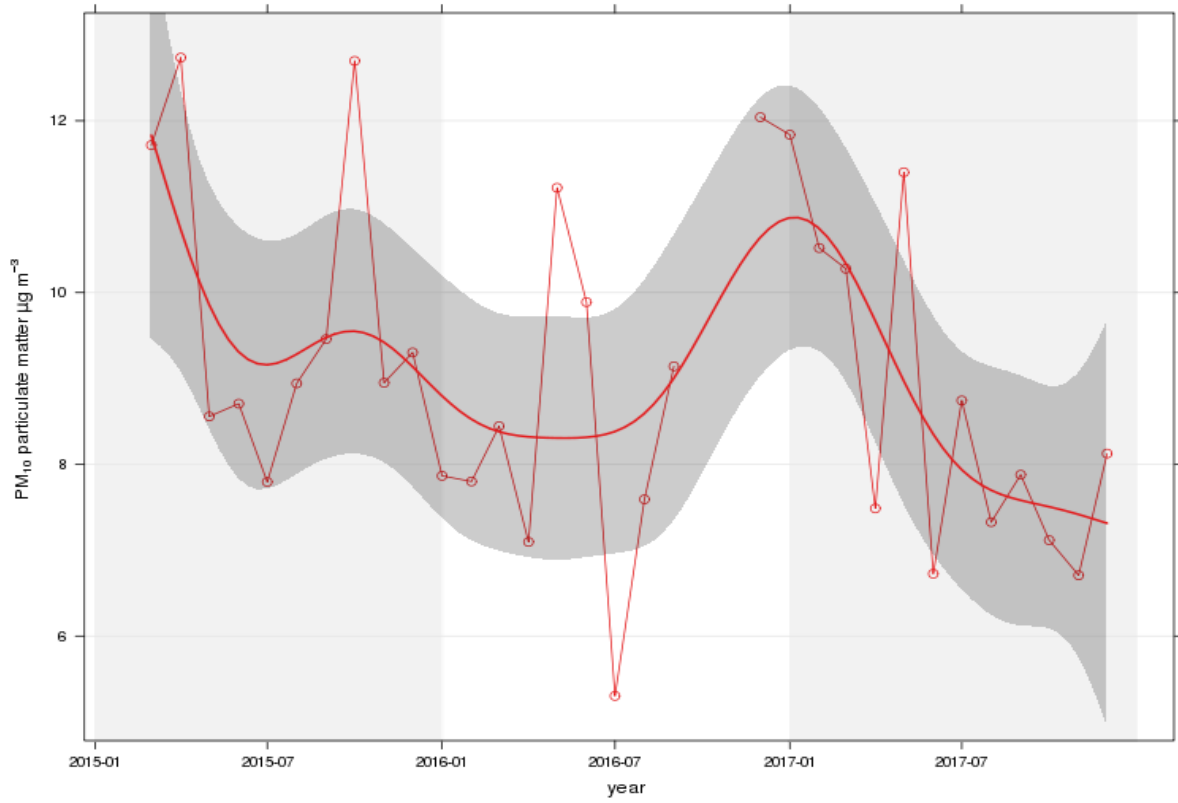


Trend for West Dunbartonshire Glasgow Road

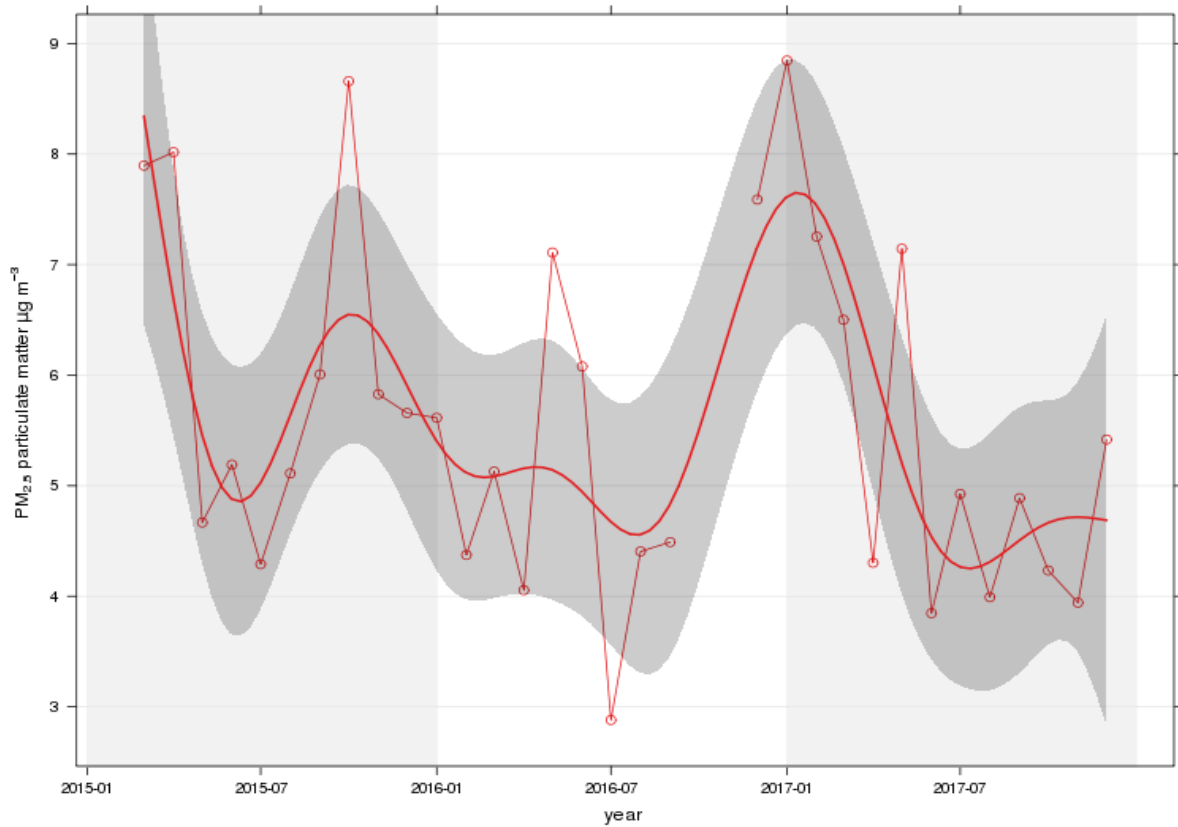


West Dunbartonshire Council

Trend for West Dunbartonshire Clydebank



Trend for West Dunbartonshire Clydebank



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 (TG16)**
- **The Environment Act 1995**
- **The Air Quality (Scotland) Regulations 2000**
- **The Air Quality (Scotland) (Amendment) Regulations 2002**
- **West Dunbartonshire Council Annual Progress Report 2016**