



Vale of Glamorgan Council 2016 Air Quality Progress Report

In fulfillment of Part IV of the Environment Act 1995
Local Air Quality Management

August 2016



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Executive Summary

The report fulfils the requirements of Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents.

This document is part of The Vale of Glamorgan Council's sixth round of Review and Assessment. Results from air quality data captured in 2015 by the Council are presented and sources of air pollution identified. The Progress Report determines those changes since the last assessment, which could lead to the risk of an air quality objective being exceeded.

This Progress Report confirms that air quality within the Vale of Glamorgan continues to meet the relevant air quality objectives, including within the existing Air Quality Management Area (AQMA) on Windsor Road, Penarth. From the 47 locations monitored throughout the Vale Borough with the use of passive diffusion tubes, one site does breach the national objective of 40µg/m³ (Site ID 56), however as this site is described as a kerbside location, following the application of Defra's "NO₂ fall-off with distance" calculator to represent levels at the nearest relevant exposure the derived result is in compliance with the national objective.

The 2015 Update and Screening Assessment (USA) report identified that a detailed assessment ought to be carried out to determine if it was appropriate to revoke the existing AQMA on Windsor Road, Penarth. At the time of writing this report, the detailed assessment has not been carried as 2016 has seen the introduction of a new analytical supplier and different, yet approved analytical method (50% TEA in acetone). As a result it has been concluded for the Windsor Road AQMA to remain in place. Shared Regulatory Services will review 2016's ratified data and where necessary undertake a Detailed Assessment to determine if it is appropriate to revoke the Windsor Road AQMA.

As part of Section 3.25 TG(16) it is a requirement to list any installations with the potential to impede on air quality with relevant exposure nearby. It was highlighted in The Vale's 2015 USA to undertake further investigations with regards to three biomass boiler installations at;

- Beili Mawr, Dyffryn
- Bryn y Ddafad Guest House
- Pen Onn Farm, LLancarfan



Of the three Biomass installations, only two have been commissioned and are currently being used (Beili Mawr, Dyffryn and Bryn y Ddafad Guest House). Using Defra's Screening Emissions Calculation Tools for Biomass Boilers and Industrial Sources both these biomass installations were shown to be compliant with their derived emissions thresholds (please see Section 3.4). With regards to Pen Onn Farm, Llancarfan, after liaising with planning department and applicant there are no details available for the particular biomass boiler as this has yet to be decided by the applicant. This case will be investigated for further details and findings will be reported in the next round of annual reports.

Monitoring of Nitrogen Dioxide and PM_{10} will continue in 2016 at the same sites as at the end of 2015.



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1 Introduction

1.1 Description of Local Authority Area

The Vale of Glamorgan Council (Vale) is a rural, coastal area adjoining the City and County of Cardiff to the east, Rhondda Cynon Taff County Council (RCT) to the North and Bridgend County Borough Council (Bridgend) to the west,

The boundaries to the east and north are major road links namely the Cardiff Bay Link Road to the east and the M4 motorway to the north. Small sections of each are within the Vale. The southern boundary is the Bristol Channel, across which are large population centres. The western boundary is the Ewenny River, which leads to the channel, via the confluence with the Ogmore River.

The major population centres within the Vale are to the southeast and comprise of Wenvoe, Penarth, Dinas Powys, Barry, Llantwit Major, Rhoose, St Athan and Cowbridge.

All but two of the major industrial processes (Part A) are concentrated to the south of Barry. The other two lie about a kilometre apart in Aberthaw. Smaller industrial processes (Part B) predominantly mineral processes are dispersed from east to west. There are two aerodromes, one military and one civilian, about two kilometres apart and a port where shipping, though not busy, is regular

1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

For Local Authorities in Wales, 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 exceedence of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in **Wales** are set out in the Air Quality (Wales) Regulations 2000, No. 1940 (Wales 138), Air Quality (Amendment) (Wales) Regulations 2002, No 3182 (Wales 298), 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 Wales

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg/m ³	Running annual mean	31.12.2003
	5.00 µg/m ³	Annual mean	31.12.2011
1,3-butadiene	2.25 µg/m ³	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m ³	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m ³	Annual mean	31.12.2004
	0.25 µg/m ³	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m ³	Annual mean	31.12.2005
Particulate matter (PM ₁₀) (gravimetric)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m ³	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

First Round of Review and Assessment

Between 1999 and 2001, the Vale published reports corresponding to stages 1, 2 and 3 of the first round of review and assessment of air quality. These assessments predicted no exceedences of any of the objectives but concluded that monitoring should continue for nitrogen dioxide (NO₂), sulphur dioxide (SO₂) and particulate matter (PM₁₀).

Second Round of Review and Assessment

Following new technical and policy guidance issued by Defra, the Vale published its first Updating and Screening Assessment (USA) in June 2003. The USA concluded that no nitrogen dioxide or (PM₁₀) exceedences were likely but that monitoring should continue. However, it was suggested that there was a requirement to continue to a Detailed Assessment for the 15- minute limit of SO₂ in Rhoose.

The Council proceeded to publish Progress Reports in 2004 and 2005, which identified exceedences of the 15-minute SO₂ objectives in Rhoose. The Vale therefore proceeded to publish a Detailed Assessment in 2005 which concluded that there was no need to declare an AQMA but to continue monitoring.

Third Round of Review and Assessment

The Vale published its second USA in June 2006, which again concluded that there was no requirement to go onto the detailed stage. However, the USA did note that NO₂ concentrations were close to the limit at Penarth due to road works and recommend that a Detailed Assessment to be carried out if there was no change.

The Council published Progress Reports in 2007 and 2008, which identified that nitrogen dioxide concentrations continued to be close to the limit value at Penarth. A Detailed Assessment was recommended.

The Detailed Assessment of NO₂ in the Penarth area was published in June 2009. It concluded that there were no exceedences of either NO₂ limit but recommended continued monitoring.

Fourth Round of Review and Assessment

The Vale published its third USA in June 2009. Nitrogen Dioxide, Sulphur Dioxide and Particulate Matter (PM₁₀) were being monitored in the area by both the Vale and RWENpower. There were no recorded nitrogen dioxide exceedences however; annual mean concentration at Windsor Road in Penarth was close to the limit. There were no exceedences of SO₂ 15-minute or 24-hour means. There were 6 exceedences of the PM₁₀ daily mean concentration and no exceedences of the PM₁₀ annual mean objective.

The 2010 Progress Report concluded that there were no exceedences of the relevant standards for any of the pollutants measured and that there was no need to proceed to a Detailed Assessment. The 2011 Progress Report concluded that there were no exceedences of the NO₂ or SO₂ objectives however; NO₂ concentrations remain close to objective in some places. A number of exceedences of the 24-hour mean for PM₁₀ were recorded in Fonmon and Penarth but still remained within the permitted 35 exceedences per annum.

Fifth Round of Review and Assessment

The Vale published its fourth USA in April 2012, which again concluded that some locations continued to be at or close to the annual mean NO₂ concentrations. Appendix D of the report contains a Detailed Assessment of the air quality in Cogan.

The Detailed Assessment identified a number of locations on Windsor Road in Penarth, where the annual mean NO₂ objective was likely to be exceeded and that no exceedences of the 1-hour mean were likely. It was therefore recommended that an Air Quality Management Area (AQMA) be declared to include, as a minimum the residential properties with concentrations above 36 µg/m³. It was also recommended that the monitoring network be extended to include locations at the façade of properties on Windsor Road, the results of which could be used to inform a further assessment.

The 2013 Progress Report recommended that; diffusion tubes with consistently low, compliant concentrations, be re-deployed in new locations; additional tubes be placed at locations where the NO₂ concentrations are consistently close to the annual mean objective with relevant exposure; Penarth's automatic monitor be relocated to within the proposed AQMA; and that the indicative PM₁₀ monitor be replaced with a gravimetric equivalence monitor. The 2014 Progress Report concluded that there was no need to proceed to a Detailed Assessment for any of the pollutants monitored.



An AQMA was declared on 1st August 2013 for a section of Windsor Road, Cogan, Penarth with respect to the annual mean objective NO₂. NO₂ concentrations are high due to congested traffic moving through a partial 'street canyon' with residential exposure along the western flank. Current AQMA is highlighted in Figure 1.1.

Sixth Round of Review and Assessment

The Vale published its fifth USA in May 2015 which confirmed that air quality within the Vale of Glamorgan continues to meet the relevant air quality objectives, including within the existing Air Quality Management Area (Windsor Road, Cogan, Penarth). 2015's USA also highlighted the need for further investigations with regards to three biomass boiler installations.



Figure 1.1 – Map of Windsor Road AQMA

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites (AMS)

The Vale Council operated two automatic monitors during 2015. Those monitors are as follows;

Penarth, Windsor Road

This monitor is operated by The Vale Council and is classified as a roadside monitor. It was commissioned in 2014 following a re-location from the site (Grid reference: 317550, 171483) to be within the Windsor Road AQMA. The monitoring site measures nitrogen dioxide, PM₁₀ and ozone (O₃). The station is calibrated by a Local Authority Officer on a fortnightly basis and serviced and maintained by Enviro Technology on a six monthly basis. Data obtained from the monitor is checked for validation and ratified by Ricardo-AEA. There are three diffusion tubes co-located at the station, whereby at the end of year, depending on data capture and precision, a locally derived bias adjustment factor is calculated. For 2015, the co-location study was deemed unsuccessful due to insufficient data capture for the AMS (<90%).

Dinas Powys Infant School

The monitor is operated by the Vale Council and is classified as a roadside monitor, located adjacent to a school, thus representing worst-case exposure. The monitoring site measures nitrogen dioxide. Annual data capture for 2015 was 96%. Data obtained is checked for validation and ratified by Ricardo-AEA. There are three diffusion tubes co-located at the station (at the façade of the Dinas Powys Primary School) whereby at the end of year, depending on data capture and precision, a locally derived bias adjustment factor is calculated. For 2015, the bias adjustment factor derived from the co-location study was 0.84. This adjustment has not been applied to the network of diffusion tubes due to the fact that the National Bias Adjustment Factor supplied by the Defra website, based on 22 studies for Gradko laboratories was slightly higher at 0.88. In order to provide a conservative approach it was therefore decided to adopt the nationally derived bias adjustment factor as this would give slightly higher concentrations and fundamentally represent a worst case scenario.

Since the most recent USA in 2015, Fonman continuous monitor is no longer in service, decommissioned 27th May 2014. Dinas Powys continuous monitor has also been shut down as of Jan/ Feb 2016.

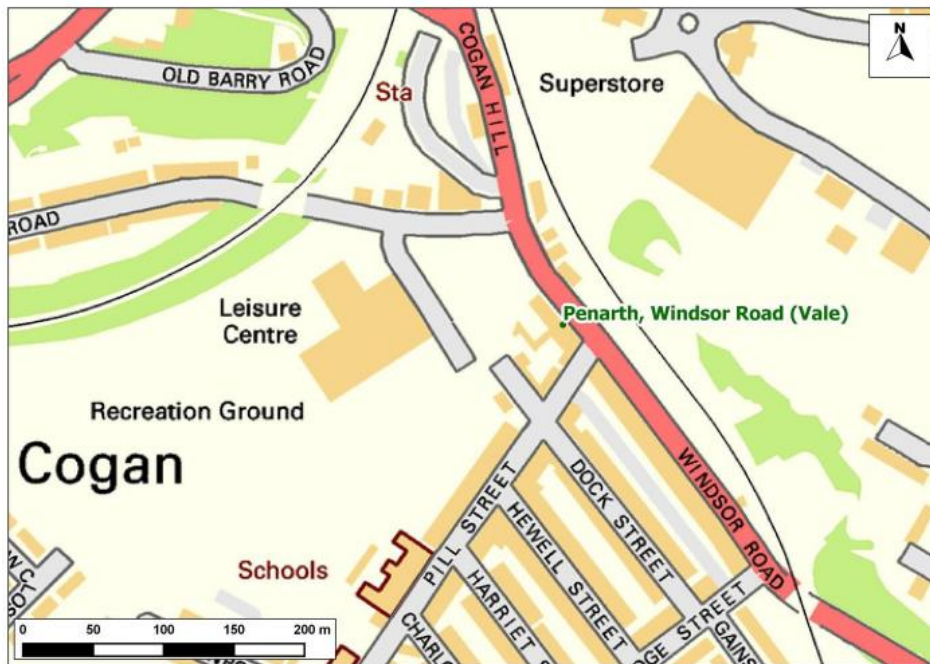


Figure 2.1 – Map of Penarth, Windsor Road Automatic Monitoring Site

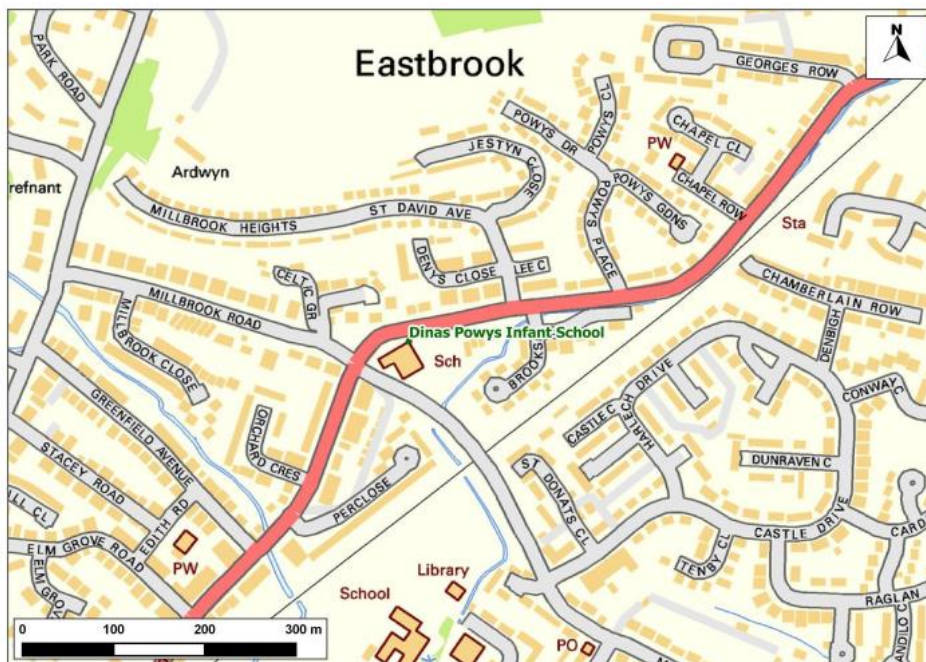


Figure 2.2 – Map of Dinas Powys Automatic Monitoring Site

Table 2.1 – Details of Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	In AQMA?	Pollutants Monitored	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m)	Does this Location Represent Worst-Case Exposure?
Penarth, Windsor Road	Roadside	317598	172399	Y	NO ₂	Chemiluminescent Analyser	2m	2m	Y
					PM ₁₀	Beta Attenuation Monitor with Gravimetric Equivalence			
					O ₃	UV absorption analyser			
Dinas Powys Infant School	Roadside	315840	171526	N	NO ₂	Chemiluminescent Analyser	10m	2m	Y

2.1.2 Non-Automatic Monitoring Sites

Vale of Glamorgan Council carries out monitoring of ambient air quality for Nitrogen Dioxide (NO₂). During the period since the Updated Screening Assessment in 2015, monitoring of NO₂ using passive diffusion tubes has been carried out at 47 locations throughout the Vale. The locations of the diffusion tubes are described in Table 2.2 and shown in Figures 2.2- 2.5.

NO₂ Diffusion Tube Locations

The location of the 6 areas where NO₂ monitoring has taken place;

- a. Cowbridge (Area A)
- b. Culverhouse (Area B)
- c. Dinas Powys (Area C)
- d. Llandough and Cogan (Area D)
- e. Penarth (Area E)
- f. Barry (Area F)

The diffusion tubes are supplied and analysed by Gradko International Ltd using the 20% triethanolamine (TEA) in water method. Further details regarding the Gradko laboratory and QA/QC procedures are provided in Appendix A2.

Figure 2.3 – Map of Non-Automatic Monitoring Sites in Cowbridge



Figure 2.4 – Map of Non-Automatic Monitoring Sites in Culverhouse



Figure 2.5 – Map of Non-Automatic Monitoring Sites in Dinas Powys

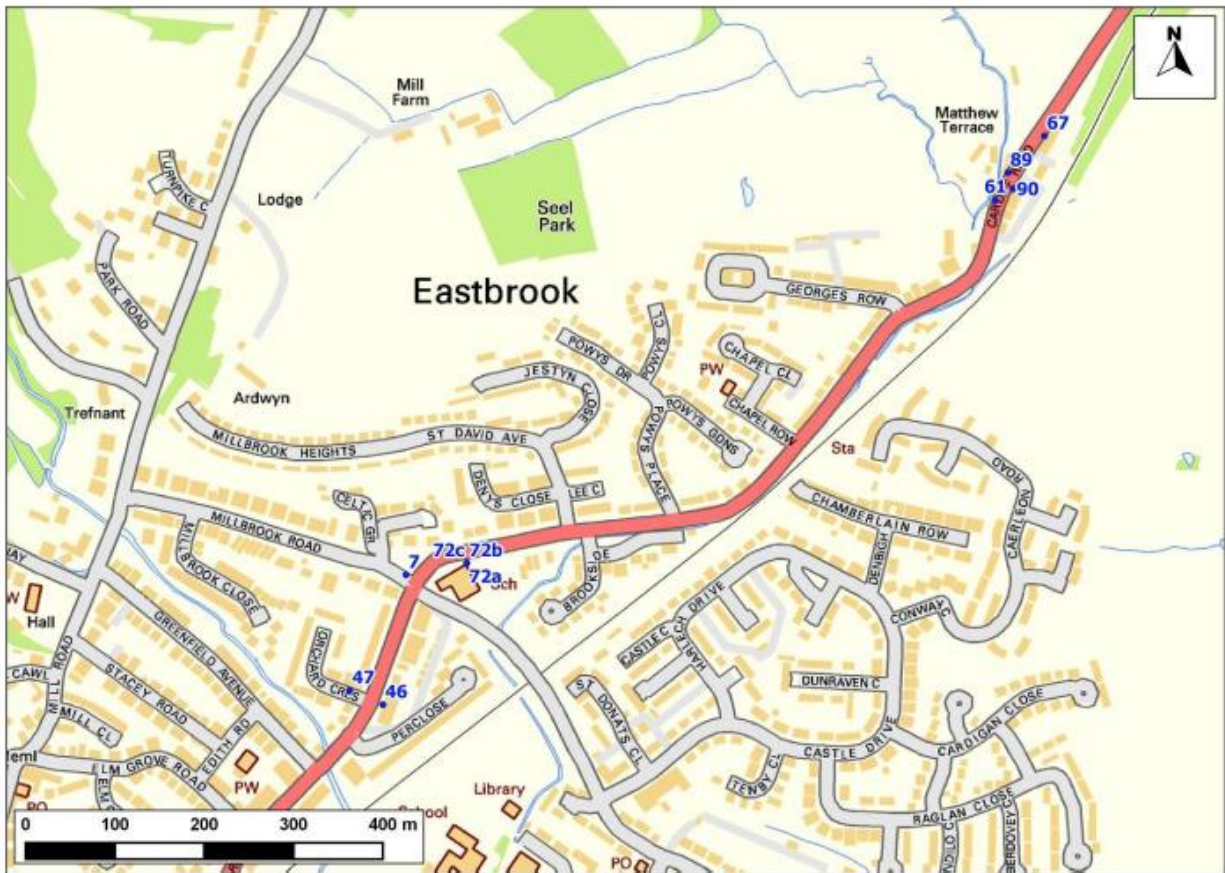


Figure 2.6 – Map of Non-Automatic Monitoring Sites in Llandough and Cogan



Figure 2.7 – Map of Non-Automatic Monitoring Sites in Penarth



Figure 2.8 – Map of Non-Automatic Monitoring Sites in Barry

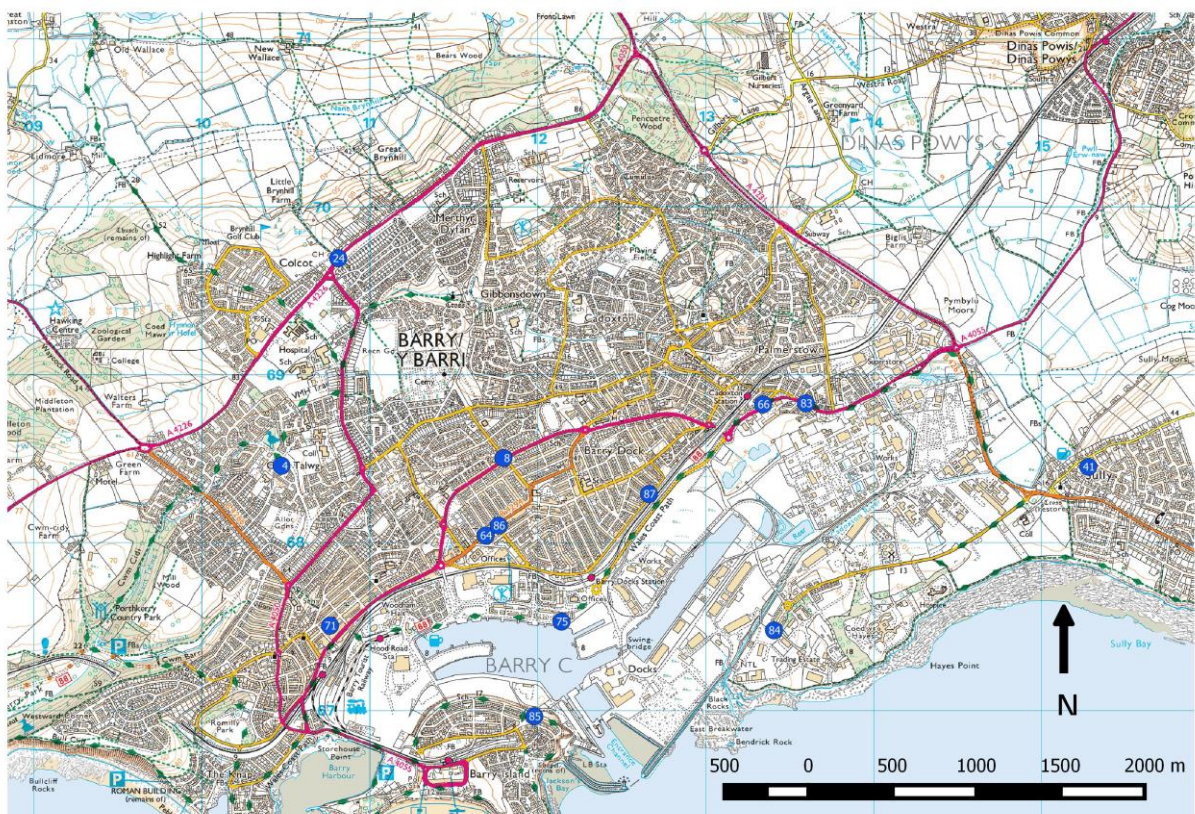


Table 2.2 – Details of Non- Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with (m) to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
COWBRIDGE										
54	High Street, Cowbridge	Kerbside	299270	174737	NO2	N	N	1m	1m	N
65	1 Riverside Mews, Cowbridge	Roadside	299614	174592	NO2	N	N	1m	3m	Y
CULVERHOUSE										
38	2 Horseshoes	Roadside	311892	174513	NO2	N	N	0m	2m	N
77	A48, Culverhouse Tesco	Roadside	311622	174772	NO2	N	N	N	4m	N
DINAS POWYS										
7	Cardiff Road/Millbrook	Roadside	315773	171514	NO2	N	N	15m	5m	N
46	46 Cardiff Road	Roadside	315747	171369	NO2	N	N	8m	3m	N
47	Dinas Powys Health Centre	Urban Background	315710	171385	NO2	N	N	4m	16m	N
61	Railway Terrace	Roadside	316433	171932	NO2	N	N	0m	2m	Y
67	2 Matthew Terrace	Roadside	316488	172004	NO2	N	N	1m	2.5m	Y



Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with (m) to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
72a	Dinas Powys Infants School	Roadside	315841	171527	NO2	N	Y	0m	7m	Y
72b	Dinas Powys Infants School	Roadside	315841	171527	NO2	N	Y	0m	7m	Y
72c	Dinas Powys Infants School	Roadside	315841	171527	NO2	N	Y	0m	7m	Y
89	9 Wayside Cottages, Cardiff Road	Roadside	316447	171963	NO2	N	N	0m	3m	Y
90	16 Railway Terrace, Cardiff Road	Roadside	316453	171945	NO2	N	N	0m	3m	Y
LLANDOUGH & COGAN										
29	Cogan Roundabout	Roadside	317406	172796	NO2	N	N	N	3m	Y
56	Andrew Road	Kerbside	316814	172443	NO2	N	N	10m	1m	Y
68	Glen View, 99 Penlan Road	Roadside	316886	172561	NO2	N	N	0m	9m	Y
69	65 Penlan Road	Roadside	316847	172948	NO2	N	N	0m	7.5m	Y
PENARTH										
22	Stanwell Road	Kerbside	318505	171496	NO2	N	N	8m	1m	N



Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with (m) to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
53	168 Windsor Road	Roadside	317589	172411	NO2	Y	N	0m	5m	Y
55	159 Windsor Road	Roadside	317595	172435	NO2	Y	N	0m	2m	Y
62	154 Windsor Road	Roadside	317633	172357	NO2	Y	N	0m	2m	Y
70	Ty-Isaf	Roadside	316731	172391	NO2	N	N	0m	3m	Y
72a	Windsor Road Monitor 1	Roadside	317598	172399	NO2	Y	Y	2m	2m	Y
72b	Windsor Road Monitor 2	Roadside	317598	172399	NO2	Y	Y	2m	2m	Y
72c	Windsor Road Monitor 3	Roadside	317598	172399	NO2	Y	Y	2m	2m	Y
74	114 Windsor Road	Roadside	317708	172259	NO2	Y	N	0m	2.5m	Y
76	160 Windsor Road	Roadside	317627	172371	NO2	Y	N	0m	2.5m	Y
78	Chelmsford Cottage	Roadside	318006	172070	NO2	N	N	0m	5m	N
79	Marine Scene	Roadside	317549	172572	NO2	N	N	N	1.2m	Y
80	113 Plassey Street	Roadside	318150	172043	NO2	N	N	0m	5.4m	Y



Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with (m) to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
81	Paget Road/ Terrace Intersection	Kerbside	318738	172333	NO2	N	N	0m	0.3m	Y
82	98b Windsor Road	Roadside	318061	171944	NO2	N	N	0m	8m	N
88	134 Windsor Road	Roadside	317668	172312	NO2	Y	N	0m	3.5m	Y
BARRY										
4	CWM Parc	Urban Background	310475	168457	NO2	N	N	0m	20m	N
8	Tynewydd Road	Kerbside	311797	168503	NO2	N	N	4m	1m	N
24	Port Road East	Roadside	310813	169693	NO2	N	N	N	2m	N
41	Dispenser Road	Urban Background	315278	168451	NO2	N	N	N	128m	N
64	20-22 Holton Road	Roadside	311690	168042	NO2	N	N	0m	3m	Y
66	17 Churchill Terrace	Roadside	313342	168823	NO2	N	N	4m	1.5m	Y
71	76 High Street (O'Donovans)	Roadside	310764	167505	NO2	N	N	0m	2m	Y
75	Catalina Road	Urban Background	312142	167529	NO2	N	N	4m	58m	N



Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with (m) to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
83	24 Cardiff Road	Roadside	313597	168829	NO2	N	N	0m	2.5m	N
84	Bendricks Road	Urban Background	313407	167477	NO2	N	N	0m	144m	N
85	Thalassa, Dyfrig Street	Urban Background	311980	166965	NO2	N	N	0m	39m	N
86	Holton Road	Roadside	311768	168101	NO2	N	N	0m	2m	N
87	110 Dock View Road	Roadside	312663	168289	NO2	N	N	0m	9m	N

2.2 Comparison of Monitoring Results with Air Quality Objectives

During 2015 monitoring was carried out for Nitrogen Dioxide and Particulate Matter (PM₁₀). There was no monitoring undertaken for benzene or 1-3-butadiene.

2.2.1 Nitrogen Dioxide (NO₂)

Nitrogen Dioxide was measured during 2015 at two sites equipped with an automatic analyser and by a network of 47 passive diffusion tubes.

2.2.2 Automatic Monitoring Data

The annual mean nitrogen dioxide concentrations at The Vale Council's two automatic monitoring locations are summarised in Table 2.3, for the years 2011 to 2015. The annual mean nitrogen dioxide concentrations for both AMS sites were below the objective in 2015. In addition there were no exceedences of the 1- hour mean objective at any of the automatic monitors (Table 2.4).

Table 2.3 – Results of Automatic Monitoring for NO₂: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period %	Valid Data Capture 2015 %	Annual Mean Concentration (µg/m ³)				
					2011	2012	2013	2014	2015
Windsor Road, Penarth	Roadside	Y	100	87	-	-	-	27.7	25.5
Dinas Powys Infant School	Roadside	N	100	96	24	24	21	15.1	20.4

Table 2.4 – Results of Automatic Monitoring for NO₂: Comparison with 1-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period %	Valid Data Capture 2015 %	Number of Hourly Means > 200µg/m ³				
					2011	2012	2013	2014	2015
Windsor Road, Penarth	Roadside	Y	100	87	-	-	-	0(86) ¹	0
Dinas Powys Infant School	Roadside	N	100	96	0(90) ²	0	0	0(50) ²	0

¹ In accordance with LAQM TG(16), where the period of valid data is less than 85%, the 99.8th percentile of hourly means is shown in brackets.

2.2.3 Diffusion Tube Monitoring Data

The nitrogen dioxide diffusion tube data is summarised in Table 2.5. The full dataset (monthly mean values) is included in Appendix A1. All data has been bias adjusted. The applied bias adjustment factor was 0.88, as described in Appendix A2. The national bias correction factor for this laboratory was utilized due to insufficient data capture from the Windsor Road, Penarth Automatic Monitor (<90%). The bias correction factor of 0.88 was obtained from the following website: <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>

Where the year data capture is less than 75% (9 months), the Bias Corrected Annual Mean Concentrations have been "annualised" following the method as in Box 7.9 & 7.10 of LAQM.TG16. Evidence of the sites annualised can be seen in Appendix A2.

The nitrogen dioxide concentrations measured by the passive diffusion tubes show that there were no exceedences within the AQMA. In total there was one bias corrected result in exceedence of the National objective (40µg/m³), this being located at site ID 56 (Andrew Road) with a result of 40.3µg/m³. However, this site is regarded as a Kerbside location and after applying Defra's "NO₂ fall-off with distance" calculation to derive levels at the nearest relevant exposure, the final result was in compliance with the National objective. As explained site ID 56 is regarded as a Kerbside location, situated next to a busy traffic intersection. At the time of writing this report, we are in the process of relocating this tube to a nearby residential façade in order to provide results representative of relevant exposure.

As previously stated in 2015 USA Report it is not necessary to extend the existing AQMA to include Site ID 79 (Marine Scene) as this kerbside location is more than 100m north of the AQMA boundary with no nearby relevant long term exposure.

Studying table 2.5 it is evident that NO₂ levels have seen a noticeable decrease or have remained stable during this monitoring period.

There are no monitoring sites in the district with concentrations above 60µg/m³ in 2015. This indicates it is unlikely that the hourly nitrogen dioxide objective will be exceeded at any location in The Vale.

Table 2.6 shows the nitrogen dioxide diffusion tube data for The Vale Council for 2011 – 2015 for comparison purposes.

Table 2.5 – Results of NO₂ Diffusion Tubes 2015

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2015 (Number of Months or %) ^a	2015 Annual Mean Concentration (µg/m ³) - Bias Adjustment factor = 0.88
COWBRIDGE						
54	High Street, Cowbridge	Kerbside	N	N	5 ^a	22.4 ^a
65	1 Riverside Mews, Cowbridge	Roadside	N	N	9	15.9
CULVERHOUSE						
38	2 Horseshoes	Roadside	N	N	12	23.3
77	A48, Culverhouse Tesco	Roadside	N	N	12	28.9
DINAS POWYS						
7	Cardiff Road/Millbrook	Roadside	N	N	11	24.6
46	46 Cardiff Road	Roadside	N	N	12	18.6
47	Dinas Powys Health Centre	Urban Background	N	N	12	14.4
61	Railway Terrace	Roadside	N	N	11	30.1
67	2 Matthew Terrace	Roadside	N	N	12	24.2
72a	Dinas Powys Infants School	Roadside	N	Y	10	23.8
72b	Dinas Powys Infants School	Roadside	N	Y	10	23.3
72c	Dinas Powys Infants School	Roadside	N	Y	9	23.7

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2015 (Number of Months or %) ^a	2015 Annual Mean Concentration ($\mu\text{g}/\text{m}^3$) - Bias Adjustment factor = 0.88
89	9 Wayside Cottages, Cardiff Road	Roadside	N	N	12	30.8
90	16 Railway Terrace, Cardiff Road	Roadside	N	N	12	21.4
LLANDOUGH & COGAN						
29	Cogan Roundabout	Roadside	N	N	12	31.8
56	Andrew Road	Kerbside	N	N	6 ^a	40.3/ 29.4^b
68	Glen View, 99 Penlan Road	Roadside	N	N	12	16.4
69	65 Penlan Road	Roadside	N	N	11	17.2
PENARTH						
22	Stanwell Road	Kerbside	N	N	12	23.7
53	168 Windsor Road	Roadside	Y	N	12	30.8
55	159 Windsor Road	Roadside	Y	N	12	27.7
62	154 Windsor Road	Roadside	Y	N	11	31.7
70	Ty-Isaf	Roadside	N	N	12	23.2
73a	Windsor Road Monitor 1	Roadside	Y	Y	12	30.2
73b	Windsor Road Monitor 2	Roadside	Y	Y	12	29.8
73c	Windsor Road Monitor 3	Roadside	Y	Y	12	30
74	114 Windsor Road	Roadside	Y	N	12	28
76	160 Windsor Road	Roadside	Y	N	12	32

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2015 (Number of Months or %) ^a	2015 Annual Mean Concentration ($\mu\text{g}/\text{m}^3$) - Bias Adjustment factor = 0.88
78	Chelmsford Cottage	Roadside	N	N	12	23.6
79	Marine Scene	Roadside	Y	N	12	37.5
80	113 Plassey Street	Roadside	N	N	12	14.3
81	Paget Road/ Terrace Intersection	Kerbside	N	N	12	16.8
82	98b Windsor Road	Roadside	N	N	12	17.4
88	134 Windsor Road	Roadside	Y	N	12	30.7
BARRY						
4	CWM Parc	Urban Background	N	N	12	13.3
8	Tynwydd Road	Kerbside	N	N	7 ^a	33.6 ^a
24	Port Road East	Roadside	N	N	12	21.3
41	Dispenser Road	Urban Background	N	N	12	13.1
64	20-22 Holton Road	Roadside	N	N	8 ^a	20.8 ^a
66	17 Churchill Terrace	Roadside	N	N	12	30.9
71	76 High Street (O'Donovans)	Roadside	N	N	12	18.4
75	Catalina Road	Urban Background	N	N	9	15.4
83	24 Cardiff Road	Roadside	N	N	12	23.2
84	Bendricks Road	Urban Background	N	N	12	12.5

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2015 (Number of Months or %) ^a	2015 Annual Mean Concentration ($\mu\text{g}/\text{m}^3$) - Bias Adjustment factor = 0.88
85	Thalassa, Dyfrig Street	Urban Background	N	N	12	11.9
86	Holton Road	Roadside	N	N	9	24.9
87	110 Dock View Road	Roadside	N	N	11	14.8

^a Result has been annualised in accordance with Boxes 7.9 and 7.10 of LAQM.TG16 as data capture for the year was less than 75%.

^b NO₂ exceedence is measured at a monitoring site not representative of public exposure. NO₂ concentration at the nearest relevant exposure calculated based on the “NO₂ fall-off with distance” calculator (<http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html>)

Table 2.6 – Results of NO₂ Diffusion Tubes (2011 to 2015)

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m ³) - Adjusted for Bias				
			2011 (Bias Adjustment Factor = 0.93)	2012 (Bias Adjustment Factor = 0.96)	2013 (Bias Adjustment Factor = 0.95)	2014 (Bias Adjustment Factor = 0.91)	2015 (Bias Adjustment Factor = 0.88)
COWBRIDGE							
54	Kerbside	N	23	25.7	26	21.5	22.4 ^a
65	Roadside	N	N/A	22.9	18	16.7	15.9
CULVERHOUSE							
38	Roadside	N	29	29	24	25.9	23.3
77	Roadside	N	36	36.4	30	29.6	28.9
DINAS POWYS							
7	Roadside	N	29	29.4	28.5	26.3	24.6
46	Roadside	N	32	23.7	22	19.7	18.6
47	Urban Background	N	17	19.2	17.5	15.6	14.4
61	Roadside	N	41	39.7	34.6	31	30.1
67	Roadside	N	N/A	28.8	30	26	24.2
72a	Roadside	N	24	29.1	24.1	27.8	23.8
72b	Roadside	N	24	28.5	26.6	28.6	23.3
72c	Roadside	N	24	28.4	25	28.5	23.7
LLANDOUGH & COGAN							
29	Roadside	N	39	37.5	35.4	32.9	31.8
56	Kerbside	N	39	40.3	38.5	33.9	40.3/ 29.4 ^b
68	Roadside	N	N/A	20.5	20.9	16.9	16.4
69	Roadside	N	11	19.1	19.8	19.6	17.2
PENARTH							
22	Kerbside	N	27	28.8	26	24.4	23.7
53	Roadside	Y	32	36.3	33	31.2	30.8
55	Roadside	Y	35	37.5	33	27.1	27.7

Site ID	Site Type	Within AQMA?	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$) - Adjusted for Bias				
			2011 (Bias Adjustment Factor = 0.93)	2012 (Bias Adjustment Factor = 0.96)	2013 (Bias Adjustment Factor = 0.95)	2014 (Bias Adjustment Factor = 0.91)	2015 (Bias Adjustment Factor = 0.88)
62	Roadside	Y	41	38.9	36	33.9	31.7
70	Roadside	N	N/A	23	19	21.9	23.2
73a	Roadside	Y	23	25	28	28.3	30.2
73b	Roadside	Y	23	25.3	28	28.3	29.8
73c	Roadside	Y	23	26.9	28	28.3	30
74	Roadside	Y	38	40.7	31	29.6	28
76	Roadside	Y	41	42	N/A	33.9	32
78	Roadside	N	N/A	27.7	26	24.1	23.6
79	Roadside	Y	40	47.6	42	39.6	37.5
80	Roadside	N	15	19.5	18	16.1	14.3
81	Kerbside	N	16	22	19	18.2	16.8
82	Roadside	N	21	21.9	21	19.6	17.4
88	Roadside	Y	N/A	N/A	34	33.5	30.7
BARRY							
4	Urban Background	N	15	16.1	17	13.2	13.3
8	Kerbside	N	33	38.2	27	32.4	33.6 ^a
24	Roadside	N	26	25.3	23	22.5	21.3
41	Urban Background	N	15	16.1	15	13.1	13.1
64	Roadside	N	N/A	28.5	21	20.2	20.8 ^a
66	Roadside	N	N/A	37.5	33	30.2	30.9
71	Roadside	N	19	20.8	19	17.8	18.4
75	Urban Background	N	18	20.8	18	18.2	15.4
83	Roadside	N	28	29.5	27	23.2	23.2
84	Urban Background	N	15	13.8	15	12.9	12.5

Site ID	Site Type	Within AQMA?	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$) - Adjusted for Bias				
			2011 (Bias Adjustment Factor = 0.93)	2012 (Bias Adjustment Factor = 0.96)	2013 (Bias Adjustment Factor = 0.95)	2014 (Bias Adjustment Factor = 0.91)	2015 (Bias Adjustment Factor = 0.88)
85	Urban Background	N	14	15.6	14	13.7	11.9
86	Roadside	N	27	34.2	18	22.8	24.9
87	Roadside	N	20	18.9	17	16.6	14.8
89	Roadside	N	N/A	N/A	34	31.2	30.8
90	Roadside	N	N/A	N/A	27	24.6	21.4

In bold, exceedence of the NO₂ annual mean AQS objective of 40 $\mu\text{g}/\text{m}^3$

Underlined, annual mean > 60 $\mu\text{g}/\text{m}^3$, indicating a potential exceedence of the NO₂ hourly mean AQS objective

^a Result has been annualised in accordance with Boxes 7.9 and 7.10 of LAQM.TG16 as data capture for the year was less than 75%.

^b NO₂ exceedence is measured at a monitoring site not representative of public exposure. NO₂ concentration at the nearest relevant exposure calculated based on the “NO₂ fall-off with distance” calculator (<http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html>)

2.2.4 Particulate Matter (PM₁₀)

Continuous monitoring of PM₁₀ is undertaken at one automatic monitoring site in The Vale District. The Penarth, Windsor Road site is located within the declared AQMA and calculates Particulate Matter using a gravimetric Beta Attenuation Monitor (BAM).

The PM₁₀ data from Windsor Road monitor has been provided as gravimetric equivalence (by applying the conversion factor of 0.83 as stipulated in Section 7.150 TG(16)) and are presented in Tables 2.7 & 2.8.

The results of the monitoring indicate that the annual average PM₁₀ concentration at the Windsor Road monitoring station is compliant with the AQS objective of 40µg/m³.

The trends in annual mean PM₁₀ concentrations for 2011 to 2015 (where available) are shown in Figure 2.9. There are no clear trends in the data over the past 5 years.

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 2015 % ^b	Confirm Gravimetric Equivalent (Y or N/A)	Annual Mean Concentration (µg/m ³)				
						2011	2012	2013	2014	2015
Penarth, Windsor Road	Roadside	Y	100	77.8	Y	-	-	-	17.5 ^{a&c}	20.8
Penarth Streetbox	Roadside	N	N/A	N/A	Y	29	20	No data	Closed	Closed
Fonman, Highway Man Inn	Rural	N	N/A	N/A	N/A	22	16	17	21	Closed
Cardiff Road, Barry	Roadside	N	N/A	N/A	Y	26	22	No data	No data	Closed

In bold, exceedence 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%

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 2015 % ^b	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg/m ³				
						2011 ^c	2012	2013 ^c	2014 ^c	2015 ^c
Penarth, Windsor Road	Roadside	Y	100	77.8	Y	-	-	-	0 (20.7)	4 (31.2)
Penarth Streetbox	Roadside	N	N/A	N/A	Y	40 (52.6)	16	No data	Closed	Closed
Fonman, Highway Man Inn	Rural	N	N/A	N/A	N/A	10	2	2 (28)	0 (30.9)	Closed
Cardiff Road, Barry	Roadside	N	N/A	N/A	Y	-	15	No data	No data	Closed

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

^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 for full calendar year is less than 90%, include the 90.4th percentile of 24-hour means in brackets

* Number of exceedences for previous years is optional

2.2.5 Sulphur Dioxide (SO₂)

No monitoring of Sulphur Dioxide was undertaken by The Vale Council in 2015.

2.2.6 Benzene

No monitoring of Benzene was undertaken by The Vale Council in 2015.

2.2.7 Other Pollutants monitored

Ozone (O₃)

The Vale monitors Ozone due to its potential correlations with other pollutants. In 2015, ozone was measured at the Windsor Road, Penarth monitoring site. Although Ozone is not included in the Local Air Quality Management system, the results are included in Table 2.9 for completeness. The results are compared with the running 8-hour mean objective as set by the Expert Panel on Air Quality Standards (EPAQs) which states the running 8-hour mean should not exceed 100µg/m³ on more than 10 days per year. There are no exceedences of the ozone objective in The Vale in 2015.

Table 2.9: Results of Automatic Monitoring of Ozone (2011 – 2015)^{a & b}

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period %	Valid Data Capture 2015 %	Number of Daily Means > 50µg/m ³				
					2011	2012	2013	2014	2015
Penarth, Windsor Road	Roadside	Y	98.7	80.4	-	-	-	2 (74)	0 (77)
Fonman, Highway Man Inn	Rural	N	N/A	N/A	15	5	18	0 (84)	Closed

a Exceedences are shown in bold

b Where annual data capture is less than 90%, the 97th percentile of the maximum daily 8-hour running mean is shown in brackets.



2.2.8 Summary of Compliance with AQS Objectives

Shared Regulatory Services have reviewed the results from monitoring undertaken across the Vale District in 2015. Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment at any existing monitoring locations.

As explained previously, although results within the AQMA fall below the objective, due to the introduction of a new analytical laboratory and different methodology used for analysis it is of best practise for the AQMA to remain in place for a further year (2016) and then review the completed 2016 yearly ratified data set.



3 New Local Developments

3.1 Road Traffic Sources

The Vale Council confirms that there are no new significant developments since the Updated Screening Assessment in 2015.

3.1.1 Narrow Congested Streets with Residential Properties Close to the Kerb

The Vale Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

3.1.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

The Vale Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

3.1.3 Roads with a High Flow of Buses and/or HGV's

The Vale Council confirms that there are no newly identified roads with high flows of buses/HGVs.

3.1.4 Junctions

The Vale Council confirms that there are no newly identified busy junctions/ busy roads.

3.1.5 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced

The Vale Council confirms that there are no new/proposed roads.



3.1.6 Roads with Significantly Changed Traffic Flows

The Vale Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.1.7 Bus and Coach Stations

The Vale Council confirms that there are no relevant bus stations in the Local Authority area.



3.2 Other Transport Sources

3.2.1 Airports

The Vale Council confirms that there are no airports in the Local Authority area.

3.2.2 Railways (Diesel and Steam Trains)

Stationary Trains

The Vale Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

Moving Trains

The Vale Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

3.2.3 Ports (Shipping)

The Vale Council confirms that there are no ports or shipping that meets the specified criteria within the Local Authority area.

3.3 Industrial Sources

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

The Vale Council has assessed new/proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

3.3.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been introduced

The Vale 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.

3.3.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

The Vale Council has assessed new/proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment

3.3.4 Major Fuel (Petrol) Storage Depots

There are no major fuel (petrol) storage depots within the Local Authority area.

3.3.5 Petrol Stations

The Vale Council confirms that there are no petrol stations meeting the specified criteria

3.3.6 Poultry Farms

The Vale Council confirms there are no poultry farms meeting the specified criteria.

3.4 Commercial and Domestic Sources

3.4.1 Biomass Combustion – Individual Installations

2015's USA identified three approved biomass boiler installations within the district that had passed through the planning stage without consideration for air quality;

- Beili Mawr, Dyffryn (approved April 2012)
- Bryn y Ddafad Guest House (approved February 2013)
- Pen Onn Farm, Llancarfan (approved November 2012)

Two of the boilers are fully commissioned and are currently being used (Beili Mawr, Dyffryn and Bryn y Ddafad Guest House). With regards to Pen Onn Farm, Llancarfan, following discussions with the planning department and applicant the installation of the biomass boiler has yet to begin. The specification of the boiler has yet to be decided by the applicant.

Following LAQM TG(16) and using Defra's screening tools for the calculation of actual and targeted emission rates, the need for further detailed assessments was evaluated. In both instances, the biomass boilers at Beili Mawr and Bryn y Ddafad Guest House indicated that actual emission rates were below the targeted emission rates, therefore both could be confidently screened out.

Beili Mawr, Dyffryn

Boiler make: Guntamatic Powerchip 101 (Unsure what specification boiler was installed so investigated the largest boiler of this range)

Boiler capacity: 101kWh

Emission Certificate: Attached in Appendix A

Table 3.1: Screening Out Study Beili Mawr, Dyffryn

Parameter	PM ₁₀	PM _{2.5}	Annual Mean NO ₂	1-Hour Mean NO ₂
Actual Emissions g/s	0.001	0.001	0.01	0.01
Targeted Emissions g/s	0.007	0.007	0.09	0.09

Bryn y Ddafad Guest House

Boiler make: Twinheat, model M20

Boiler capacity: 26.7kWh

Emission certificate: Attached in Appendix A

Table 3.2: Screening Out Study Bryn y Ddafad Guest House

Parameter	PM ₁₀	PM _{2.5}	Annual Mean NO ₂	1-Hour Mean NO ₂
Actual Emissions g/s	0.0008	0.0008	0.004	0.004
Targeted Emissions g/s	0.0033	0.0033	0.04	0.04



3.4.2 Biomass Combustion – Combined Impacts

The Vale Council confirms that there are no combined biomass combustion plants in the Local Authority area.

3.4.3 Domestic Solid-Fuel Burning

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

4 Planning Applications

For 2015 there have been no relevant applications submitted.

At the time of writing this report there has been one relevant application submitted. The application is for ground plus 4 storey new build proposal to provide 44 affordable housing units (2016/0015/OUT).

The proposed development lies between the northern edge of the declared AQMA on Windsor Road, Penarth and the mini roundabout and road intersection to the north. Opposite the proposal is diffusion tube Site ID 79, Marine Scene.

As part of The Vale Council's efforts to aid with Air Quality in relation to new developments, an Air Quality Assessment has been produced by the contractors and comments have been passed. The assessment considers the implications of increased traffic on local roads, which may impact on air quality at existing residential properties. It also looks at how new residents residing in the apartments will be impacted by road traffic emissions from the adjacent road network. The main pollutants considered relating to traffic emissions are nitrogen dioxide and fine particulate matter (PM10 and PM2.5). The application is still awaiting a final decision.



5 Air Quality Planning Policies

Local Development Plan (LDP) 2011- 2026. The document provides a framework for sustainable development within the Vale of Glamorgan, outlining strategies and policies for future land use and development.

There are two policies with particular relevance to air quality;

MD4- Community Infrastructure and Planning Obligations

Policy discusses new and improved community infrastructure, facilities and services. In terms of air quality it states;

“Community infrastructure may include the provision or improvement of: Environmental protection and enhancement such as nature conservation, nature conservation, flood prevention, town centre regeneration, pollution management or historic renovation.”

MD8- Environmental Protection

Policy addresses how new development proposals will be required to demonstrate that negative impacts on the natural environment will not breach unacceptable levels; Pollution of land, surface water, ground water and the air.

Where proposed developments indicate negative impacts, measures and mitigation methods must be detailed to enable impacts to be minimised to an acceptable level. For example, in terms of air quality, measures can include the production of an Air Quality Assessment and the implementation of conditions.

6 Local Transport Plans and Strategies

The Local Transport Plan (LTP) 2015- 2030. The Vale of Glamorgan authority is part of the Capital Region which comprises of Cardiff and the nine south east unitary authorities. The implementation of this policy was carried out in order to support Welsh Government's vision in the future development of the Capital Region and commitment to a low carbon future.

"The Capital Region is committed to a low carbon future, which has a transport network and mobility culture that positively contributes to a thriving economy and the health and wellbeing of its citizens and where sustainable travel is the option of choice"

The LTP looks to tackle growing traffic levels (and hence air quality impacts) by providing strategies which focus upon providing efficient and effective transport networks. In order to be successful the plans need a collaborative approach for the future development of the Capital Region's transport needs, therefore providing improved mobility for both residents and visitors, enhanced accessibility to jobs and services and fundamentally sustainable economic growth.

"This Local Transport Plan (LTP) seeks to identify the sustainable transport measures required to ensure the Vale of Glamorgan Council adheres to current requirements and good practices to allow for a sustainable transport environment for the period 2015 to 2020 as well as looking forward to 2030"

The LTP policy recognises the Council's objective to achieving sustainable travel (alternatives to using cars) and reducing negative impacts on the environment. The policy suggests that through improved transport infrastructure and transport services this can be achieved.

The LTP lists its proposed schemes for the next 5 years which will aid in improving transport infrastructure and services, which in turn drive healthier air quality. Schemes of high priority or currently being undertaken;

-National Cycle Network Route 88 and associated local, urban and rural connections to include new future identified Active Travel routes

- A4050 Culverhouse Cross to Cardiff Airport Element 1 Barry Docks Link Road to Garden Centre, Wenvoe (*Provide cycle infrastructure to enable a cycling network as identified by Sustrans and other Plans, including School Travel Plans (STPs). This route also links Cardiff Airport to Barry and the rural villages, with possible links to St Athan and the Enterprise Zone. Segments of the corridor already in place*)

- A4050 Culverhouse Cross to Cardiff Airport Element 2: A4050 Port Road to Cardiff Airport *(This route also links Cardiff Airport to Barry and the rural villages, with possible links to St Athan and within the Enterprise Zone).*

-Barry Waterfront to Dinas Powys Cycle Route *(Provide off-road cycle route from Biglis Roundabout to Dinas Powys linking Barry to Dinas Powys)*

-A4050 Culverhouse Cross to Cardiff Airport Bus Priority *(Provide Bus Priority measures along this commuter corridor. (Bus priority to encompass a range of measures to make bus travel more attractive, including new infrastructure and information)*

-Barry Island Link Road *(To provide a new access road from Barry Waterfront to Barry Island to alleviate the congestion on the Causeway to Barry Island and to access new development on the Waterfront.)*

-Gileston – Old Mill B4265 *(To provide road improvements where there are severe width restrictions on this access road to St Athan and the Enterprise Zone and Airport).*

-Improvements to the A4226 between Waycock Cross, Barry and Sycamore Cross, A48 (Five Mile Lane) *(To provide off line improvements to this very busy corridor to assist with access to the strategic highway network and to the airport Enterprise Zone).*

-Service 321 – Llantwit Major to Cowbridge to Talbot Green *(New trial supported local bus service that will join together two of the council's current strategic local bus services. The service will connect with the existing service 320 at Talbot Green and the 303 service in Llantwit Major. Times will be revised on these services to ensure fluidity in linking services).*

-Welsh Government Pilot Project – Integrated Transport provision within the authority *(As part of the WG funded integrated transport project the Public Transport Team are bringing in elements of community transport, mainstream school services and social services transport. The project funded a new Greenlinks vehicle that is being used to combine these forms of transport that were previously outsourced.)*



7 Climate Change Strategies

Carbon Management

Sustainability is a thread that runs throughout the Vale of Glamorgan. To reflect this, the Vale Local Service Board and its partners have made a commitment to reduce the carbon emissions produced by those buildings in the Vale owned by Local Service Board partner organizations.

To help the Local Service Board reduce their carbon emissions the Carbon Trust appointed ARUP to undertake a study on behalf of the Local Service Board. The study identified the best and worst performing buildings in the Vale in terms of carbon emissions and suggested a carbon emission target for the group to achieve.

Green Dragon

The Council is committed to obtaining at least Green Dragon Level 1 across the whole of the Council. Green Dragon is a scheme that raises awareness of environmental issues among businesses and staff and promotes sustainable working practices including:-

- reduced waste disposal costs
- increased efficiency
- improved processes
- aids in the achievement of national legislation

8 Implementation of Action Plans

Following the declaration of the Windsor Road, Cogan, Penarth AQMA, on 1st August 2013, the Vale of Glamorgan Council was required by Section 84(2) of the Environment Act 1995 to carry out a “Further Assessment” of air quality within the AQMA.

This Further Assessment focused exclusively on the Windsor Road, Penarth AQMA and concluded that the declaration of the AQMA was justified based upon measured concentrations of nitrogen dioxide available at the time. However, the assessment noted that measured concentrations of nitrogen dioxide in 2013, since the declaration of the AQMA, suggested that traffic management initiatives may have improved air quality within the AQMA.

The assessment concluded;

- The declaration of the Windsor Road AQMA was justified given the monitoring data available from relevant locations at the time the declaration was made.
- That cars and Light Goods Vehicles account for approximately 80-85% of total vehicle emissions in Windsor Road.
- A reduction in total vehicle emissions of 21.5% would have been required to achieve the annual mean air quality objective at the worst-case receptor location in 2012.

In terms of an Action Plan, the Assessment highlighted that an Air Quality Action Plan focused on lowering road traffic emissions within the AQMA should be developed should the 2014 ratified monitoring data indicate that measured concentrations of nitrogen dioxide are above national air quality objectives at relevant locations. However, should 2014 measured concentrations of nitrogen dioxide at relevant locations be below national air quality objectives then monitoring should continue until firm conclusions as to long term concentrations can be reached.

Following on from the Further Assessment, it is evident from the NO₂ data collated via passive diffusion tubes and automated monitoring system (Tables 2.3 & 2.6) for 2014 & 2015 is consistently below the national objective. As stipulated by the Further Assessment; an Action Plan is only considered necessary if the objective is exceeded. A detailed assessment has not been carried as at the time of writing this report as 2016 has seen the introduction of a new analytical supplier and different, yet approved analytical method (50% TEA in



acetone). It has therefore been concluded that the Windsor Road, Penarth AQMA would remain following the review of 2016's ratified data it is recommended that a Further Assessment be carried out to determine if it is appropriate to revoke the Air Quality Management Area.

With regards to the proposed Further Assessment, the same approach will be adopted as for 2014's assessment, as this will enable clear comparisons to be made and air quality sufficiently assessed. The Assessment will consider;

- Measured pollutant concentrations within the AQMA
- Regional and local background concentrations of NO₂ (and NO_x) using background maps
- Calculation of any required reduction in NO₂ (and NO_x) to meet objective. Although this may not be required if measures levels continue below the objective
- Obtain traffic flow data. and consider source apportionment using Emission Factor Toolkit
- Test hypothesis that reduction in annual average concentrations is due to re-signalisation e.g. increased traffic flow. A sample of traffic data is available prior signalisation and was used to inform the Detailed Assessment in 2011.

In terms of an interim Action Plan, The Vale Council has drawn together the following elements;

- Continue to monitor NO₂ at current diffusion tube locations
- Continue to monitor NO₂ and Particulate Matter (PM₁₀) with the use of the automatic analysers located within the AQMA.
- Recommend the installation of a permanent traffic counter in the vicinity of automatic site. This will enable correlation between pollutant concentrations and traffic flow.
- Comment on planning applications likely to force significant traffic through the AQMA, in particular those close to Site ID 79 (Marine Scene). Recommend conditions requiring air quality impact assessments



9 Conclusions and Proposed Actions

9.1 Conclusions from New Monitoring Data

The Vale Council has examined the results from monitoring in the district. There was one annual bias adjusted exceedence of the annual average Air Quality Standard of (40µg/m³), this being located at site ID 56 (Andrew Road) with a result of 40.3µg/m³. However, this site is regarded as a Kerbside location and after applying Defra's "NO₂ fall-off with distance" calculation to derive levels at the nearest relevant exposure, the final result was in compliance with the National objective. At the time of writing this report, we are in the process of relocating this tube to a nearby residential façade in order that future results are indicative of relevant exposure.

All other locations, including monitoring locations within the declared AQMA; Windsor Road, Penarth were below the national objective for 2015.

9.2 Conclusions relating to New Local Developments and Sources

The only significant relevant development is that of Cogan Hill described earlier in this report. As stated the decision whether or not this development proceeds is still undecided. The Progress Report has not identified any significant changes in emissions sources within The Vale of Glamorgan. The installation of three biomass boilers within the district have been screened out as their rural locations and distance to any relevant exposure poses little or no concern.

9.3 Proposed Actions

The Progress Report has identified that NO₂ and PM₁₀ concentrations continue to satisfy national objectives. With the implementation of a new analytical laboratory and different, yet approved analytical method (50% TEA in water) monitoring locations will remain the same and Windsor Road, Penarth will still be declared as an AQMA. Monitoring will continue and following the review of 2016's ratified data it is recommended that a Further Assessment be carried out to determine if it is appropriate to revoke the Air Quality Management Area.

With regards to the AQMA The Vale Council will;



- Continue to monitor NO₂ at current diffusion tube locations
- Continue to monitor NO₂ and Particulate Matter (PM₁₀) with the use of the automatic analysers located within the AQMA.
- Recommend the installation of a permanent traffic counter in the vicinity of automatic site. This will enable correlation between pollutant concentrations and traffic flow.
- Comment on planning applications likely to force significant traffic through the AQMA, in particular those close to Site ID 79 (Marine Scene). Recommend conditions requiring air quality impact assessments

10 References

1. 2014 Air Quality Progress Report for The Vale of Glamorgan Council In fulfillment of Part IV of the Environment Act 1995 Local Air Quality Management Date May 2014.
2. 2014 Air Quality Further Assessment Windsor Road, Cogan, Penarth AQMA for The Vale of Glamorgan Council In fulfillment of Section 84(2) of the Environment Act 1995 Local Air Quality Management Date January 2015.
3. Planning Application & Associated Documents 2016/00115/OUT
4. Planning Application & Associated Documents 2012/01306/FUL
5. Planning Application & Associated Documents 2011/01021/FUL
6. Planning Application & Associated Documents 2012/00227/FUL
7. Planning Application & Associated Documents 2016/00115/OUT
8. Department for Environment, Food and Rural Affairs, 2003. *Part IV of the Environment Act 1995, Environment (Northern Ireland) Order 2002 Part III Local Air Quality Management, Technical Guidance LAQM.TG(16)*. London: DEFRA (as updated April 2016)
9. Vale of Glamorgan Planning Link
<http://vog.planning-register.co.uk/plaDetails.aspx>
10. UK National Air Quality Archive LAQM
<http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>
11. LAQM Helpdesk – June 2015
<http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>
12. <http://laqm.defra.gov.uk/review-and-assessment/tools/emissions.html#biomass>
13. Vale of Glamorgan Local Development Plan 2011- 2026
14. Vale of Glamorgan's The Local Transport Plan (2015- 2030)
http://www.valeofglamorgan.gov.uk/en/living/planning_and_building_control/planning_policy/local_transport_plan.aspx
15. Vale of Glamorgan Green Dragon
http://www.valeofglamorgan.gov.uk/en/living/environment/green_dragon/green_dragon.aspx

Appendices

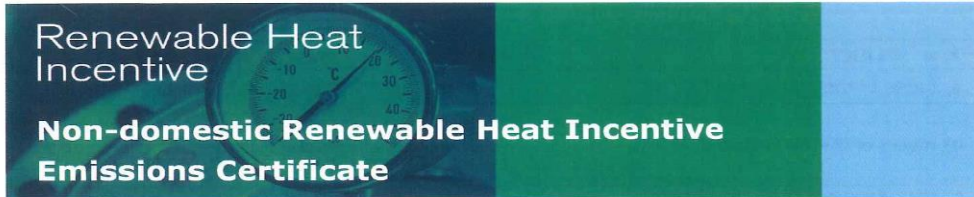
Appendix A: Diffusion Tube Monitoring Data 2015

Site No	Nitrogen Dioxide Sites VALE CBC	Grid Ref	Class	Distance of measurement from Kerb (m)	Distance from Kerb to Receptor	Relevant Exposure in m	Background Concentration (If required for distance correction)	07/07/2015 - 14/02/2015	04/02/2015 - 04/02/2015	04/02/2015 - 01/04/2015	01/04/2015 - 20/04/2015	20/04/2015 - 28/05/2015	28/05/2015 - 01/07/2015	01/07/2015 - 20/07/2015	20/07/2015 - 26/08/2015	26/08/2015 - 30/09/2015	30/09/2015 - 28/10/2015	28/10/2015 - 02/12/2015	02/12/2015 - 06/01/2016	AVERAGE SINCE JAN 15	Bias Corrected (Correction Factor 0.88)	Distance corrected to F-Grade (If required)	Percentage of Data Capture
COWBRIDGE																							
54	High Street, Cow bridge	SS 299270 174737	Kerbside	1.00	2.00	1.00																	
65	1 Riverside Mews, Cow bridge	SS 299614 174692	Roadside	3.00	4.00	1.00																	
CULVERHOUSE																							
38	2 Horseshoes	SS 311892 174513	Roadside	2.00	2.00	0.00																	
77	A48 Culverhouse Tesco	SS 311622 174772	Roadside	4.00	4.00	33.05																	
DINAS POWYS																							
7	Cardiff Road/Milbrook	SS 315773 171514	Roadside	5.00	20.00	15.00																	
46	46 Cardiff Road	SS 315747 171369	Roadside	3.00	11.00	8.00																	
47	Dinas Powys Health Centre	SS 315710 171385	Urban Background	16.00	20.00	4.00																	
61	Railway Terrace	SS 316433 171932	Roadside	2.00	2.00	0.00																	
67	2 Matthew Terrace	SS 316488 172034	Roadside	2.50	3.50	1.00																	
72a	Dinas Powys Infants School	SS 315841 171527	Roadside	7.00	7.00	0.00																	
72b	Dinas Powys Infants School	SS 315841 171527	Roadside	7.00	7.00	0.00																	
72c	Dinas Powys Infants School	SS 315841 171527	Roadside	7.00	7.00	0.00																	
LANDOUGH & COGAN																							
29	Cogan Roundabout	SS 317406 172796	Roadside	3.00	3.00	0.00																	
56	Andrew Road	SS 316814 172443	Kerbside	1.00	1.00	0.00																	
68	Glen View, 99 Penlan Road	SS 316886 172561	Roadside	9.00	9.00	0.00																	
69	65 Penlan Road	SS 316847 172945	Roadside	7.50	7.50	0.00																	
PENARTH																							
22	Starw el Road	SS 318505 171486	Roadside	1.00	9.00	8.00																	
53	168 Windsor Road	SS 317589 172411	Roadside	5.00	5.00	0.00																	
55	159 Windsor Road	SS 317596 172435	Roadside	2.00	2.00	0.00																	
62	154 Windsor Road	SS 317633 172357	Roadside	2.00	2.00	0.00																	
70	Ty-llaf	SS 318731 172391	Roadside	2.00	3.00	1.00																	
72a	Windsor Road Monitor 1	SS 317598 172399	Roadside	2.00	4.00	2.00																	
72b	Windsor Road Monitor 2	SS 317598 172399	Roadside	2.00	4.00	2.00																	
72c	Windsor Road Monitor 3	SS 317598 172399	Roadside	2.00	4.00	2.00																	
74	114 Windsor Road	SS 317708 172259	Roadside	2.50	2.50	0.00																	
76	160 Windsor Road	SS 317627 172371	Roadside	2.50	2.50	0.00																	
78	Chelmsford Cottage	SS 318006 172970	Roadside	5.00	5.00	0.00																	
79	Marine Scene	SS 317549 172572	Roadside	1.20	4.00	2.80																	
80	113 Passy Street	SS 318150 172043	Roadside	5.40	5.40	0.00																	
81	Paget Road/ Terrace Intersection	SS 318738 172333	Kerbside	0.30	0.30	0.00																	
82	98b Windsor Road	SS 318061 171944	Roadside	8.00	8.00	0.00																	
88	134 Windsor Road	SS 317668 172312	Roadside	3.50	3.50	0.00																	
BARRY																							
4	QVM Parc	SS 310475 168457	Urban Background	20	20	0																	
8	Tynwydd Road	SS 311797 168503	Kerbside	1	5	4																	
24	Port Road East	SS 310813 169693	Roadside	2	4	2																	
41	Depenser Road	SS 315278 168451	Urban Background	128	128	0																	
64	20-22 Holton Road	SS 311690 168042	Roadside	3	3	0																	
66	17 Churchill Terrace	SS 313342 168823	Roadside	1.5	6	4.5																	
71	76 High Street (O'Donovans)	SS 310764 167655	Roadside	2	2	0																	
75	Catalina, Y Rhodfa	SS 312142 167529	Urban Background	58	62	4																	
83	24 Cardiff Road	SS 313597 168829	Roadside	2.5	2.5	0																	
84	Bendricks Road	SS 313407 167477	Urban Background	144	144	0																	
85	Thalassa, Dyfrig Street	SS 311980 166965	Urban Background	39	39	0																	
86	Holton Road	SS311788 168101	Roadside	2	2	0																	
87	110 Dock View Road	SS 312663 168289	Roadside	9	9	0																	
89	9 Wayside Cottages, Cardiff Road	SS 316447 171963	Roadside	3	3	0																	
90	16 Railway Terrace, Cardiff Road	SS 316453 171945	Roadside	3	3	0																	





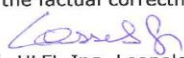
Beili Mawr, Dyffryn Biomass Boiler Emissions Certification

ofgem e-serve Making a positive difference for energy consumers



This certificate provides evidence that the tested boiler meets the air quality requirements of the non-domestic Renewable Heat Incentive (RHI). It must be issued by a testing laboratory. Applicants applying for the RHI with biomass boilers must submit a certificate with their application, or alternatively, an environmental permit.

BLT 0790/13, Guntamatic Heiztechnik GmbH, Powerchip 20/30 to Powerchip 101, chipped wood

1. TEST HOUSE	
a) name and address of testing laboratory	 BLT Wieselburg HBLFA Francisco Josephinum AT 3250 Wieselburg, Rottenhauser Straße 1 blt@josephinum.at , http://blt.josephinum.at
b) name and signature of the person authorised by the testing laboratory to issue the certificate	For the accredited test institute: Dipl.-Ing. Heinrich Prankl  For the factual correctness:  Dipl.-HLFL-Ing. Leopold Lasselsberger
c) date of issue of the certificate together with certificate reference number	Date of issue: 09/12/2013 Reference number: 0790/13 BLT Wieselburg test report, approval no: 014/09 BLT Wieselburg test report, approval no: 058/06 BLT Wieselburg, reference number: 0196/08 BLT Wieselburg test report, approval no: 006/08 BLT Wieselburg test report, approval no: 038/08
d) if testing laboratory is accredited to ISO 17025, date of accreditation and accreditation number (note: if testing conducted after 24 Sep. 2013, the testing laboratory must be ISO 17025 accredited)	A 0112 Date of accreditation: October 19, 2009 Initial date of accreditation: September 1, 1998 Federal Ministry of Economy, Family and Youth Division I/12 – Accreditation Body





2. a PLANT	Plant 1	Plant 2	Plant 3
a) name of the plant tested	Powerchip 20/30	Powercorn 50	Powerchip 75
b) model of the plant tested	Chipped wood heating boiler Powerchip 20/30	Chipped wood heating boiler Powercorn 50	Chipped wood heating boiler Powerchip 75
c) manufacturer of the plant tested	Guntamatic Heiztechnik GmbH Bruck 7 AT 4722 Peuerbach, AUSTRIA		
d) installation capacity of the plant in kilowatts (kW)	30,0	49,5	75,0
e) is the plant a <u>manually stoked, natural draught</u> plant? (that is, without a fan providing forced or induced draught)	no	no	no
f) the date the plant was tested	05/03/2009	21/11/2006	family member
g) list of all the plants in the type-testing range of plants to which the certificate applies, if any ¹	Chipped wood heating boiler Guntamatic Powerchip 20/30 / Powercorn 50 / Powerchip 75/100/101		

2. b PLANT	Plant 4	Plant 5	-
a) name of the plant tested	Powerchip 100	Powerchip 101	-
b) model of the plant tested	Chipped wood heating boiler Powerchip 100	Chipped wood heating boiler Powerchip 101	-
c) manufacturer of the plant tested	Guntamatic Heiztechnik GmbH Bruck 7 AT 4722 Peuerbach, AUSTRIA		
d) installation capacity of the plant in kilowatts (kW)	99,0	101,0	-
e) is the plant a <u>manually stoked, natural draught</u> plant? (that is, without a fan providing forced or induced draught)	no	no	-
f) the date the plant was tested	01/02/2008	20/10/2008	-
g) list of all the plants in the type-testing range of plants to which the certificate applies, if any ¹	Chipped wood heating boiler Guntamatic Powerchip 20/30 / Powercorn 50 / Powerchip 75/100/101		

¹ The type-testing approach enables testing laboratories to provide assurance that all boilers in a given range meet the air quality requirements, without needing to specifically test each boiler.



3. FUELS	
a) types of fuels used when testing	Chipped wood B1 according to EN 303-5
b) based on the testing, list the range of fuels that can be used in compliance with the emission limits of 30 grams per gigajoule (g/GJ) net heat input for particulate matter (PM), and 150 g/GJ net heat input for oxides of nitrogen (NOx) <i>(based if relevant on classifications from EN 14961 or EN 303-5)</i>	Chipped wood B1 according to EN 303-5
c) moisture content of the fuel used during testing Plant 1 Plant 2 Plant 4 Plant 5	18,5 – 19,0 % 25,3 – 26,3 % 24,3 – 33,6 % 24,3 – 33,6 %
d) maximum moisture content of the fuel which can be used so as to ensure that the emission limits are not exceeded	≤ 35 % according to EN 303-5

4. TESTS	
a) if the plant is 500 kW or lower, and BS EN 303-5:1999 or EN 303-5:2012² applies to it, please confirm: - tests were conducted to whichever standard was current at the time of testing. <i>(please circle the applicable standard)</i>	EN 303-5:1999
b) if the plant is 500 kW or lower, and BS EN 303-5:1999 or BS EN 303-5:2012 do not apply to it, please confirm: - emissions of PM represent the average of at least three measurements, each of at least 30 minutes duration and; - the value for NOx emissions is derived from the mean of measurements made throughout the PM tests.	not applicable not applicable
c) if the plant is 500 kW or higher, please confirm: - emissions of PM represent the average of at least three measurements, each of at least 30 minutes duration and; - the value for NOx emissions is derived from the mean of PM measurements made throughout the PM tests.	not applicable not applicable
d) please confirm the tests were conducted to: - EN 14792:2005 in respect of NOx, and; - EN 13284-1:2002 or ISO 9096:2003 in respect of PM ³	yes yes
e) please confirm the plant tested at ≥ 85 % of its rated output	yes
f) please confirm the tests show that emissions were no greater than 30 g/GJ PM and 150 g/GJ NOx	yes

² BS EN303-5:1999 and 2012 explain what should be measured and when.

³ These standards explain how to make the PM and NOx measurements.



g) measured emissions of PM in g/GJ net heat input	
Plant 1 – Powerchip 20/30	9 g/GJ (nominal heat output) 12 g/GJ (minimum heat output)
Plant 2 – Powercorn 50	11 g/GJ (nominal heat output) nm ^{*)} (minimum heat output)
Plant 3 – Powerchip 75 (family member)	11 g/GJ (nominal heat output) nm ^{*)} (minimum heat output)
Plant 4 – Powerchip 100	10 g/GJ (nominal heat output) nm ^{*)} (minimum heat output)
Plant 5 – Powerchip 101	10 g/GJ (nominal heat output) nm ^{*)} (minimum heat output)
h) measured emissions of NOx in g/GJ net heat input	
Plant 1 – Powerchip 20/30	88 g/GJ (nominal heat output) 72 g/GJ (minimum heat output)
Plant 2 – Powercorn 50	96 g/GJ (nominal heat output) nm ^{*)} (minimum heat output)
Plant 3 – Powerchip 75 (family member)	99 g/GJ (nominal heat output) nm ^{*)} (minimum heat output)
Plant 4 – Powerchip 100	102 g/GJ (nominal heat output) 43 g/GJ (minimum heat output)
Plant 5 – Powerchip 101	102 g/GJ (nominal heat output) 43 g/GJ (minimum heat output)

*) nm ... not measured



Bryn y Ddafad Guest House Biomass Boiler Emissions Certification



In order to accredit any biomass boiler or stove applications received for the domestic or non-domestic Renewable Heat Incentive (RHI) schemes, Ofgem must be satisfied that a valid emissions certificate exists for the specific model in the application (or alternatively for the non-domestic RHI, an environmental permit for the site). This template incorporates all information required to demonstrate that the tested plant meets the air quality requirements of the RHI. It must be fully completed and issued by a testing laboratory in order to be a valid certificate.

1. TEST HOUSE	
a) Name and address of the testing laboratory that has carried out the required tests and issued this certificate * <i>*If different, include details of both</i>	Danish Technological Institute Kongsvang Allé 29 8000 Aarhus C Denmark
b) Name and signature of the person authorised by the testing laboratory to issue the certificate	Torben Nørgaard Jensen <i>Torben Nørgaard Jensen</i>
c) Date of issue of this certificate, together with certificate reference number for this certificate <i>*Please see Note A</i>	01/04/2014 rhi-v5 Twin Heat M20i 300-ELAB-2024_P704049
d) If the testing laboratory that has carried out the required tests is accredited to BS EN ISO/IEC 17025:2005, date of accreditation and accreditation number <i>(if testing conducted on or after 24 September 2013, the testing laboratory must be BS EN ISO/IEC 17025:2005 accredited at the time of testing)</i>	09/07/1993 DANAK No.300

2. PLANT - Please see Note B	
a) Name of the plant tested	Twin Heat
b) Model of the plant tested* <i>*Please ensure this is the same as in the manufacturer's documentation and boiler nameplate</i>	Twin Heat M20i
c) Manufacturer of the plant tested	Twin Heat A/S
d) Installation capacity* of the tested plant in kilowatts (kW) <i>*The total installed peak heat output capacity</i>	26.7



e) Is the plant a <u>manually stoked, natural draught</u> plant? (without a fan providing forced or induced draught)	No
f) (i) Date the plant was tested* (ii) Please confirm that NO _x and PM have been tested on the same occasion <i>*This is in reference to the emissions testing for PM and NO_x, not any wider range of tests. A specific date is required. Please provide the date of test performed at ≥85% of the installation capacity. If more than one model has been tested or testing has been conducted on different dates for different fuels, please list each date with details.</i>	Wood pellets: 03/10/2007 Wood Chips: 11/09/2013 Yes
g) Please list all the plants in the type-testing range* of the tested plants to which the certificate applies, if any. ¹ Please include the installation capacity of each model. <i>*This must follow the ratio rules: If the smallest plant in the range is 500kW or less, the largest plant in the range can't be more than double the smallest. If the smallest plant in the range is over 500kW, the largest plant in the range can't be more than 500kW greater than the smallest.</i>	M20i - 26.7 ME20i - 26.7 MCS20i - 26.7

3. FUELS	
a) Types of fuels used when testing (where relevant, this should include how the fuel has been processed and based if relevant on classifications from EN14961 or EN303-5. eg. wood pellets/compressed wood, wood chip. We don't expect broader categories such as 'beech', 'wood'.)	Wood pellets Wood Chips
b) Based on the testing, list the range of fuels that can be used in compliance with the emission limits of 30 grams per gigajoule (g/GJ) net heat input for particulate matter (PM), and 150 g/GJ net heat input for oxides of nitrogen (NO _x) (where relevant, this should include how the fuel has been processed and based if relevant on classifications from EN14961 or EN303-5. eg. wood pellets/compressed wood, wood chips. We don't expect broader categories such as 'beech', 'wood')	Wood pellets Wood Chips
c) Moisture content of the fuel used during testing	Wood pellets: 7.3 % Wood Chips: 20.1 %
d) Maximum allowable moisture content* of fuel that can be used with the certified plant(s) that ensures RHI emission limits are not exceeded. <i>*This value may be obtained from ranges specified in EN 303-5 based on the fuel type(s) tested</i>	Wood pellets: ≤10% Wood Chips: ≤30%

¹ The type-testing approach enables testing laboratories to provide assurance that all boilers in a given range meet the air quality requirements, without needing to specifically test each boiler.



4. TESTS	
Confirm which requirements the emissions of NOx and PM have been tested in accordance with. Either 4a or 4b must be confirmed to be a valid RHI certificate.	
a) Was the testing carried out in accordance* with all of the provisions relevant to emissions of PM and NOx in either BS EN 303-5:1999 or BS EN 303-5:2012? ² <i>*It is not a requirement that the tested plant must be within the scope of one of these standards, as long as the test lab can confirm that all of the relevant provisions were followed appropriately</i>	Yes – BS EN 303-5:1999
b) Was the testing carried out in accordance with all of the following requirements? (i) - EN 14792:2005 in respect of NOx emissions - EN 13284-1:2002 or ISO 9096:2003 in respect of PM emissions ³ (ii) emissions of PM represent the average of at least three measurements of emissions of PM, each of at least 30 minutes duration (iii) the value for NOx emissions is derived from the average of measurements made throughout the PM emission tests.	-
c) Please confirm the plant was tested at ≥85% of the installation capacity of the plant.	Yes
d) Please confirm the test shows that emissions from the plant were no greater than 30 g/GJ PM and 150 g/GJ NOx.	Yes
e) Measured* emissions of PM in g/GJ net heat input <i>*This average value should be from the test confirmed in 4c. Results from partial load tests are not required. This value must be in the specified units.</i>	Wood pellets: 14 Wood chips: 17
f) Measured* emissions of NOx in g/GJ net heat input <i>*This average value should be from the test confirmed confirmed in 4c. Results from partial load tests are not required. This value must be in the specified units.</i>	Wood pellets: 54 Wood chips: 71

Note A: If details from a previously issued certificate or an original test report are being transferred to this RHI emission certificate template, please note that this document must be **issued by the testing laboratory** as a separate certificate. The issue date and certificate reference number should be in relation to this certificate produced using the RHI template, not the issue date and reference number of the original certificate or test report.

Note B: If you are including multiple tested plants on one certificate, please ensure that all sections are completed for each tested plant, and are laid out such that it is clear which details relate to which tested plant. If a type-testing range is included as well, please show clearly which type-testing range relates to which tested plant(s), following the type-testing range ratio rules outlined in 2g.

² BS EN303-5:1999 and 2012 explain what should be measured and when.

³ These standards explain how to make the PM and NOx measurements.

Appendix B: QA/QC Data

Diffusion Tube Bias Adjustment Factors

A database of bias adjustment factors determined from Local Authority co-location studies throughout the UK has been collated by the LAQM Helpdesk. The National Diffusion Tube Bias Adjustment Factor Spreadsheet (Version 06/16) was used to obtain an overall adjustment factor of 0.88 from the input data shown in the following screen shot. This overall factor is based on 27 co-location studies where the tube preparation method and analysis laboratory used were the same as those used by The Vale Council.

Figure B.1: National Diffusion Tube Bias Adjustment Factor Spreadsheet

National Diffusion Tube Bias Adjustment Factor Spreadsheet						Spreadsheet Version Number: 06/16				
Follow the steps below in the correct order to show the results of relevant co-location studies						This spreadsheet will be updated at the end of September 2016				
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods						Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet				
This spreadsheet will be updated every few months; the factors may therefore be subject to change. This should not discourage their immediate use.						LAQM Helpdesk Version				
The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partner AECOM and the National Physical Laboratory.						Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.				
Step 1:	Step 2:	Step 3:	Step 4:							
Select the Laboratory that Analyzes Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor ² shown in blue at the foot of the final column.							
If a laboratory is not shown, we have no data for this laboratory.	If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data.	If you have your own co-location study then see footnote 1. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953							
Analyzed By ¹	Method ¹	Year ¹	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m ³)	Automatic Monitor Mean Conc. (Dm) (µg/m ³)	Bias (B)	Tube Precision ²	Bias Adjustment Factor (A) (Cm/Dm)
Grantha	28X TER in water	2015	R	Redd and North Down Borough Council	12	38	25	48.5X	G	0.67
Grantha	28X TER in water	2015	UC	Brecknock Council	12	38	23	5.5X	G	0.33
Grantha	28X TER in water	2015	R	Cheriton Borough Council	12	35	35	2.7X	G	0.37
Grantha	28X TER in water	2015	R	Lisvane & Caerboronagh City Council	18	35	23	24.8X	G	0.88
Grantha	28X TER in water	2015	R	Llanidloes Borough Council	12	45	44	5.8X	G	0.94
Grantha	28X TER in water	2015	R	Manorbaydon Coastal Council	12	41	37	11.8X	G	0.98
Grantha	28X TER in water	2015	B	Penarth Borough Council	18	4	1	35.7X	G	0.73
Grantha	28X TER in water	2015	R	City of Liswell Council	12	33	33	17.3X	G	0.85
Grantha	28X TER in water	2015	R	Paranagh Council of King's Lynn and West Norfolk	12	23	22	32.5X	G	0.75
Grantha	28X TER in water	2015	R	Cheshire West and Chester	18	38	48	-5.2X	G	1.05
Grantha	28X TER in water	2015	R	Dudley MBC	12	47	58	-5.3X	G	1.05
Grantha	28X TER in water	2015	R	Dudley MBC	12	48	35	14.8X	G	0.88
Grantha	28X TER in water	2015	R	Dudley MBC	12	34	31	18.8X	G	0.91
Grantha	28X TER in water	2015	UP	Dudley MBC	11	23	13	28.5X	G	0.93
Grantha	28X TER in water	2015	KS	Marple Moor Road Laboratories	12	182	81	28.2X	G	0.73
Grantha	28X TER in water	2015	UP	Llanymyneon	12	28	22	5.8X	G	1.18
Grantha	28X TER in water	2015	R	Porthcawl City Council	12	23	27	8.3X	G	0.92
Grantha	28X TER in water	2015	R	Thermonk Borough Council	12	28	23	22.5X	G	0.82
Grantha	28X TER in water	2015	R	Galebrook Council	11	33	34	-1.2X	G	1.01
Grantha	28X TER in water	2015	R	Galebrook Council	12	28	27	3.3X	G	0.95
Grantha	28X TER in water	2015	R	Galebrook Council	18	35	32	11.5X	G	0.98
Grantha	28X TER in water	2015	KS	New Farnell DC	11	47	35	34.4X	P	0.75
Grantha	28X TER in water	2015	R	New Farnell DC	11	33	25	34.7X	G	0.75
Grantha	28X TER in water	2015	UC	Swilthampton City Council	12	28	23	-5.5X	G	1.04
Grantha	28X TER in water	2015	R	Walsingham Borough Council	11	35	33	7.3X	G	0.93
Grantha	28X TER in water	2015	R	Driffton & New City Council	3	47	38	24.4X	G	0.81
Grantha	28X TER in water	2015	R	HOTTINGHAM CITY COUNCIL	12	48	33	4.3X	G	0.95
Grantha	28X TER in water	2015		Overall Factor² (27 studies)					Blue	0.88

Discussion of Choice of Factor to use

The bias adjustment factor applied to all 2015 data is 0.88. The applied bias adjustment factor has been calculated using the national diffusion tube bias adjustment factor spreadsheet version 06/16. The individual bias adjustment factor calculated using Dinas Powys Primary School Penarth automatic monitoring system has not been adopted as the bias adjustment factor derived from the study was slightly less than the figure generated by

the national, 0.84 compared to 0.88. Therefore it was deemed good practise to use the nationally derived bias adjustment factor as this would reflect a “worst-case scenario”. The individual bias adjustment factor calculated using Windsor Road, Penarth automatic monitoring system and the co-located triplicate diffusion tubes has not been used due to insufficient data capture (<90%) at the automatic monitoring site.

PM Monitoring Adjustment

The PM monitor at the Penarth, Windsor Road site is a Beta Attenuation Monitor (BAM) with gravimetric equivalence. Therefore in order to present the data as gravimetric equivalence, a conversion factor of 0.83 has been applied, using the European Standards.

Short-term to Long-term Data Adjustment

The Nitrogen Dioxide (NO₂) obtained via the use of passive diffusion tubes during January to December 2015 were annualised via the method described in Boxes 7.9 & 7.10 of LAQM TG(16). Due to the location of the Windsor Road, Penarth AMS (Roadside), two long-term AURN **urban background** continuous monitoring sites, within a distance of approximately 50 miles from The Vale were selected, Cwmbran and Bristol St Paul’s.

Table B.1 – Long term AURN sites used for calculation of nitrogen dioxide annualisation ratio for Diffusion Tube 56 (Andrew Road)

Site	Site Type	Annual Mean (µg/m ³)	Period Mean (µg/m ³)	Ratio
Cwmbran AURN	Urban Background	11.97	9.49	1.26
Bristol St Paul's AURN	Urban Background	26.04	21.2	1.23
Average Ratio				1.25

Table B.2 – Long term AURN sites used for calculation of nitrogen dioxide annualisation ratio for Diffusion Tube 8 (Tynewydd)

Site	Site Type	Annual Mean (µg/m ³)	Period Mean (µg/m ³)	Ratio
Cwmbran AURN	Urban Background	11.97	10.24	1.17
Bristol St Paul's AURN	Urban Background	26.04	24.06	1.08
Average Ratio				1.13

Table B.3 – Long term AURN sites used for calculation of nitrogen dioxide annualisation ratio for Diffusion Tube 64 (20-22 Holton Road)

Site	Site Type	Annual Mean ($\mu\text{g}/\text{m}^3$)	Period Mean ($\mu\text{g}/\text{m}^3$)	Ratio
Cwmbran AURN	Urban Background	11.97	11.43	1.05
Bristol St Paul's AURN	Urban Background	26.04	27.01	0.96
Average Ratio				1.01

Table B.4 – Long term AURN sites used for calculation of nitrogen dioxide annualisation ratio for Diffusion Tube 54 (Highstreet Cowbridge)

Site	Site Type	Annual Mean ($\mu\text{g}/\text{m}^3$)	Period Mean ($\mu\text{g}/\text{m}^3$)	Ratio
Cwmbran AURN	Urban Background	11.97	10.62	1.13
Bristol St Paul's AURN	Urban Background	26.04	23.63	1.10
Average Ratio				1.12

QA/QC of Automatic Monitoring

The Vale's automatic monitors are calibrated by Vale's Air Quality Officer Representative on a fortnightly basis. The quality assurance/ quality control (QA/QC) procedures used are equivalent to UK AURN procedures. Calibration readings are recorded and sent to Ricardo-AEA to ratify the data for these sites. An independent audit is carried out annually.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes are supplied and analysed by Gradko International Ltd using the 20% triethanolamine (TEA) in water method. Gradko International Ltd participates in the Annual Field Inter-Comparison Exercise and Workplace Analysis Scheme for Proficiency (WASP) inter-comparison scheme for nitrogen dioxide diffusion tube analysis. From April 2014 the WASP Scheme was combined with the STACKS scheme to form the new AIR scheme, which Gradko International Ltd participates in. The AIR scheme is an independent analytical proficiency testing scheme operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). The Gradko laboratory follows the procedures set out in the Harmonisation Practical Guidance and is UKAS accredited.

Information regarding tube precision can be obtained via <http://laqm.defra.gov.uk/diffusion-tubes/precision.html> Information regarding WASP results can be obtained via <http://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html>

Uncertainties

All values presented in this report are the best possible estimates, but uncertainties in the results might cause over-or under-predictions. All of the measured concentrations presented have an intrinsic margin of error. DEFRA and the Das suggest that this is of the order of plus or minus 20% for diffusion tube data and plus or minus 10% for automatic measurements.

The UK Government's Air Quality Expert Group (AQEG) has published a report on trends in primary nitrogen dioxide in the UK (AQEG, 2007). This examines evidence that shows that while NO_x emissions have fallen in line with predictions made a decade previously, the composition of NO_x has, in some urban environments, changed. This may have caused nitrogen dioxide levels at some locations to fall less rapidly than was expected. The latest guidance from DEFRA and the DAs (2009) has been followed regarding NO_x to NO₂ relationships.

The limitations to the assessment should be borne in mind when considering the results set out in preceding sections.