Shared Regulatory Services
Gwasanaethau Rheoliadol a Rennir

Appendix 1

Vale of Glamorgan Council

VALE of GLAMORGAN
BRO MORGANNWG

Vale of Glamorgan Council
2018 Air Quality Annual Progress Report

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

August 2018

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Executive Summary: Air Quality in Our Area

Local authorities have a statutory duty under Part IV of the Environment Act 1995 & Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 to manage local air quality. The Local Air Quality Management (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 air quality objectives are likely to be achieved.

The air quality objectives applicable to LAQM in Wales are set out in the Air Quality (Wales) Regulations 2000, No. 1940 (Wales 138) and Air Quality (Amendment) (Wales) Regulations 2002, No 3182 (Wales 298). Where the air quality reviews indicate that the air quality objectives may not be met the local authority is required to designate an Air Quality Management Area (AQMA). Action must then be taken at a local level and outlined in a specific Air Quality Action Plan (AQAP) to ensure that air quality in the identified area improves.

In line with the Vale of Glamorgan Council's (VoG) statutory duties, under Part IV of the Environment Act 1995 Shared Regulatory Services (SRS) on behalf of VOG undertakes regular air quality monitoring at specifically allocated locations across The Vale District using automated and non-automated principles for ambient air Nitrogen Dioxide (NO_2), Particulate Matter (PM_{10})) & Ozone (O_3).

With regards to prioritising ambient air quality sampling locations, the Council adopts a risk based approach to any allocation of monitoring sites, considering the requirements of The Department for Environment, Food and Rural Affairs' (Defra) Local Air Quality Management Technical Guidance 16, February 2018 (previously April 2016). The designated monitoring locations are assigned based on relevant exposure and where the certain Air Quality Objective levels for a particular pollutant applies. TG(16) states that annual mean objectives should apply at "All locations where members of the public might be regularly exposed. Building facades of residential properties, schools, hospitals, car homes etc."

Automatic Monitoring Site

In 2017 VOG operated 1 automatic analyser located on Windsor Road, Penarth. The monitoring site measures on a 24/7 basis measuring levels of nitrogen dioxide, PM_{10} and ozone (O_3) and forms part of the Welsh Air Quality Network. The results of this air quality monitoring can be viewed online at http://www.welshairquality.co.uk.

New to 2018, the VOG gave commitment to facilitate enhanced monitoring capabilities via purchasing two near real time indicative air quality analysers. The analysers have been specifically located in the Barry area of the Borough and represents relevant exposure. The analysers continuously monitor for Nitric Oxide, Nitrogen Dioxide & Ozone, PM10 & PM2.5, and do so every 15 minutes (data uploaded every hour). Information regarding the specification of the monitors can be viewed at https://www.aqmesh.com/product/

Details of the monitoring sites and their collected datasets can be viewed via the SRS webpage at http://www.srs.wales/en/Environmental-Health/Noise-and-Air-Pollution/Air-quality-and-pollution/Air-Monitoring.aspx?Site=1&Date=2018-09-17

Non-automatic Monitoring Sites

There are 47 specifically allocated non automatic monitoring sites across the Vale District which monitor levels of nitrogen dioxide (NO_2). These sites are supported and maintained by SRS on behalf of the VOG. The non-automatic sites do not provide live data; instead they consist of diffusion tubes which are placed at each of the sites, collected and replaced on a rolling monthly basis. The results derived from the tube sampling are then averaged over the year to enable a comparison of the results against the annual average **(40µg/m^3)** and 1-hour **(200µg/m^3 not to be exceeded > 18 times per year)** air quality objectives for NO_2.

As previously discussed in the 2017 APR, the NO_2 diffusion tube network was revised and extended to encapsulate known areas of particularly elevated traffic flows and foreseeable development, all with nearby relevant exposure. These areas include Llantwit Major, Gileston, St Athan, Rhoose (Fonmon), Barry Docks and Saint Brides Major.

For 2018 SRS on behalf of the VOG further revised the network of diffusion tubes to improve certain monitoring locations, therefore capturing levels at “worst-case” sensitive receptors (residential facades).

This APR confirms that in 2017 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.

This Annual 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, no sites breach the national NO_2 annual objective of 40µg/m3 or the NO_2 1-hour objective (**200µg/m3, not to be exceeded more than 18 times per year).** Detailed in the Local Air Quality Management (LAQM) TG(16), Paragraphs 7.90 & 7.91 focus on predicting exceedences of the NO_2 1-hour objective (**200µg/m3, not to be exceeded more than 18 times per year)** with the use of NO_2 diffusion tubes. It is stated that ***"exceedances of the NO2 1-hour mean are unlikely to occur where the annual mean is below 60µg/m3."*** Therefore, based on the 2017 datasets it can be concluded that the NO_2 1 hour objective was not breached.

As part of Section 3.25 LAQM TG(16) it is a requirement to list any installations with the potential to impede on air quality with relevant exposure nearby. In February 2017 a planning application was received for a retaining wall and concrete base (approx. 15m x 4m) to accommodate a new containerised biomass boiler plant, comprising of a biomass boiler, storage of pellets, control equipment and associated plant. The site proposed for the works is at The Docks Office, Subway Road, Barry. Using Defra's Screening Emissions Calculation Tools for Biomass Boilers and Industrial Sources the biomass installation was shown to be compliant with their derived emissions thresholds (please see Section 3.4).

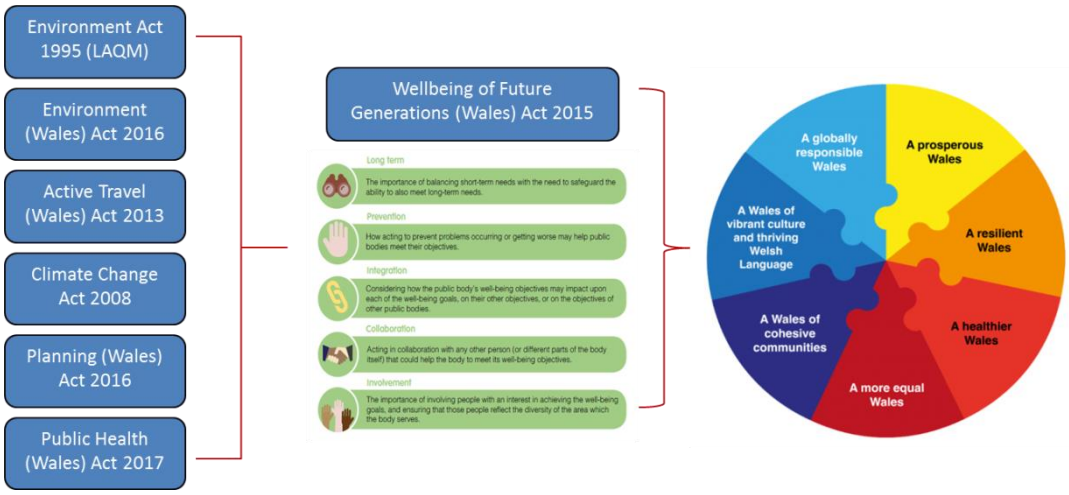
It was previously highlighted in the 2017 APR that due to continual compliance over a three year period with the national air quality objectives set for NO_2 (annual average 40µg/m^3 & 1-hour average 200µg/m^3 not be exceeded more than 18 times per year), in accordance with Local Air Quality Management in Wales, Policy Guidance, June 2017, the Vale of Glamorgan Council wish to revoke the Windsor Road, Penarth AQMA. Unfortunately a detailed assessment is yet to be finalised to support this decision to revoke the Windsor Road AQMA and demonstrate compliance with the air quality objectives for future years for the defined AQMA. At the time of writing this report, due to the delays in producing a detailed assessment over a years' worth of data has been collected which again supports the justification to revoke the AQMA. It is therefore a priority that officers will compile this report and following an appropriate review and consultation with the local communities affected, the Council will submit a formal request to Welsh Government to approve the revocation of the AQMA.

VOG adopts the principles of The Well-being of Future Generations (Wales) Act 2015. The Act is a significant enabler to improve air quality as it calls for sustainable cross-sector action based on the

principles of long-term, prevention-focused integration, collaboration and involvement. It intends to improve economic, social, environmental and cultural well-being in Wales to ensure the needs of the present are met without compromising the ability of future generations to meet their own needs. The Act places responsibilities on public bodies in Wales to work in new ways (including via Public Services Boards) towards national Well-being goals. Progress is measured against a suite of well-being and Public Health Outcomes Framework indicators; there is one specifically concerned with air pollution.

As **Figure 1.1** illustrates below, the Act is the legislative vehicle for "Health in all Policies in Wales" and provides the underpinning principles for all policy and decision making, including economic development, in Wales. Reducing air pollution, health risks and inequalities can help contribute to most, if not all, of the well-being goals. As such, the Act presents excellent opportunities to change policy and practice to enhance air quality management arrangements across The Vale (and wider).

Figure 1.1- The Well- being of Future Generations (Wales) Act 2015 Matrix



Actions to Improve Air Quality

Improved monitoring

- In an effort to improve its monitoring capabilities, for 2018, as part of a yearly review SRS have amended and improved the network of diffusion tubes previously assigned in previous years used for the LAQM regime. The amendments include improved monitoring locations to represent the locality of monitoring objectives and implementation of additional sites.

- In 2018 SRS on behalf of the VOG has commissioned two near real-time indicative automatic monitors. The AQ Mesh analysers continuously monitor for Nitric Oxide, Nitrogen Dioxide & Ozone, PM10 & PM2.5, and do so every 15 minutes (data uploaded every hour). The data from the pod is sent to a cloud server where it is corrected for temperature, pressure and relative humidity as well as cross gas interference. Data is available to view via the SRS webpage at; http://www.srs.wales/en/Environmental-Health/Noise-and-Air-Pollution/Air-quality-and-pollution/Air-Monitoring.aspx

Publications & Policies

Local Development Plan (2011- 2026)

On the 28th June 2017 the Council adopted the Vale of Glamorgan Local Development Plan 2011-2026. The LDP became operative on its adoption and supersedes the previous adopted Unitary Development Plan (UDP). The LDP will be the basis for decisions on land use planning in the Vale of Glamorgan and will be used by the Council to guide and manage new development proposals.

Cardiff and Vale University Health Board Report

The report issued in 2017 examines how making active travel alternatives can lead to sustainable improvements in our health and well-being. The report focuses upon Cardiff and Vale's air quality concerns and recognises that alternative sustainable transport is a key enabler to improving air quality. The report can be viewed here http://www.cardiffandvaleuhb.wales.nhs.uk/moving-forwards/

Public Transport

Improving Bus Networks

The VOG are committed to improving air quality. With the envisaged desire to improve traffic fleet composition and increase the uptake of sustainable alternatives and fuels, it is extremely encouraging to find out from the VOG about adopted improved bus fleets and the routes these services use. The contracted bus company **New Adventure Travel (NAT)** currently runs a local bus service (89a & 89b). The service runs through Dinas Powys, Llandough, Penarth (including Windsor Terrace and Pill Street), and into Cardiff Bay and Cardiff. Approximately 6000 passenger journeys are undertaken on this service each month. The operator runs two hybrid buses on the service. These buses run on electric when doing speeds of 30 miles per hour or less. The buses then run off diesel when undertaking speeds above 30 miles per hour. Using hybrid buses on these routes reduces carbon emissions, specifically in areas where speeds are 30 miles per hour or less, in particular around Penarth, Llandough and Dinas Powys.

Improvements for Sustainable Transport & Infrastructure- Penarth

The Vale of Glamorgan Council has received a significant financial contribution (£1.4million) from the developers of Penarth Heights for Sustainable Transport improvements in the vicinity of the site.

The financial contribution was secured via a Section 106 Agreement which requires the contribution to be spent at follows: “means information, facilities or infrastructure which provides or improves access for pedestrians, cyclists, public transport users, taxis or car sharers in the vicinity of the site [Penarth Heights].”

To date, the Council has used this contribution to implement a number of schemes, including:

- zebra crossings on Plassey Street
- the lighting scheme at the zig-zag path;
- the woodland footpath and steps from Paget Road to Penarth Marina; and
- cycle parking for key destinations in Penarth; and
- the 95A bus service.

There is circa £1.1million remaining, with a contribution of £160k to undertake highway improvements. The Council has therefore been considering a number of options for improvements to the Windsor Road/ Plassey Street Roundabout and enhancing the layout and materials used in this area to create an attractive 'Gateway' to Penarth Town Centre.

A number of options have been considered for this junction to improve pedestrian and cyclist movements between Plassey Street, Penarth Town Centre and Cogan and to create an attractive 'Gateway' entrance to the Town, with improved access for pedestrians and cyclists.

Please note that these options are in draft format and therefore materials and landscaping have not been included within the designs. Further detailed designs would be undertaken once a preferred option has been identified. In addition to traffic modelling, an independent road safety audit would need to be carried out for any preferred option to be progressed.

Further information regarding these proposals can be found using the following link;

http://www.valeofglamorgan.gov.uk/en/our_council/consultation/Penarth-Heights-Highways-and-Sustainable-Transport-Consultation.aspx

Cogan Pill Street / Windsor Road junction improvements

The above junction was redesigned / remodelled within the last two to three years to create a short right hand turn ghost island into the Pill Street which successfully reduced the occurrence of vehicles waiting to turn right impacting the straight ahead flows heading towards Penarth and causing traffic to queue back towards Barons Court junction resulting in excessive congestion along the Windsor Road corridor. To achieve the right hand turn ghost island the existing puffin pedestrian crossing immediately north of Pill Street was relocated some 20 – 30 metres further north to maintain suitable pedestrian crossing facilities.

Cycle schemes

With regards to cycle schemes there have been two schemes implemented in the Cogan/ Windsor Road remit within the last 5 to 10 years.

1. A shared pedestrian / cycle facility has been constructed within the Dingle Park adjacent the Windsor Road to provide a convenient footway / cycle link improving safety and convenience for vulnerable road users and encouraging alternative modes of transport. North of Dingle Park the cycle route is signed on highway via Bridge Street, Dock Street & Little Dock Street to provide access into Penarth Leisure Centre and then on via Andrew Road to Cogan Station for those who are commuting.

2. An advisory on carriageway cycleway has been provided along Plassey Street from its junction with Arcot Street to Windsor Road junction. This ties in with the cycle facilities mentioned in 1 above and also links in with a contraflow cycleway provided along Arcot Street (South) providing good access to Penarth Town Centre and provides good access via sides streets towards Penarth Marina via Arcot

Street (North) and Paget Road to the Cardiff Bay barrage and beyond to Cardiff City Centre. Again this encourages safe use of alternate modes of transport for both leisure cyclists and commuters.

Local Priorities and Challenges

The main priorities for SRS and Vale of Glamorgan Council in the coming year are;

-Finalise and deliver the supporting detailed assessment to revoke the Penarth, Windsor Road AQMA.

How to Get Involved

VOG welcomes any correspondence relating to air quality enquiries or concerns. Shared Regulatory Services (SRS) Specialist Services Team represents CC for air quality management and therefore is contactable via the webpage www.srs.wales/en/Home.aspx. Hourly and monthly average monitoring data for pollutants measured at the Penarth, Windsor Road site is available at https://airquality.gov.wales/

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1. Actions to Improve Air Quality

1.1 Previous Work in Relation to Air Quality

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 (NO_2), sulphur dioxide (SO_2) and particulate matter (PM_{10}).

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 (PM_{10}) 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 SO_2 in Rhoose.

The Council proceeded to publish Progress Reports in 2004 and 2005, which identified exceedences of the 15-minute SO_2 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 NO_2 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 NO_2 in the Penarth area was published in June 2009. It concluded that there were no exceedences of either NO_2 limit but recommended continued monitoring.

Fourth Round of Review and Assessment

The Vale published it third USA in June 2009. Nitrogen Dioxide, Sulphur Dioxide and Particulate Matter (PM_{10}) 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 SO_2 15-minute or 24-hour means. There were 6 exceedences of the PM_{10} daily mean concentration and no exceedences of the PM_{10} 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 NO_2 or SO_2 objectives however; NO_2 concentrations remain close to objective in some places. A number of exceedences of the 24-hour mean for PM_{10} 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 NO_2 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 NO_2 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 ≥36 µg/m^3. 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 NO_2 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 PM_{10} 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, Penarth with respect to the annual mean objective NO_2. NO_2 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 1.2.

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 continued to meet the relevant air quality objectives, including within the existing Air Quality Management Area (Windsor Road, Penarth). 2015's USA also highlighted the need for further investigations with regards to three biomass boiler installations.

The 2016 Annual Progress Report confirmed that air quality within the Vale of Glamorgan continued to meet the relevant air quality objectives, including within the existing Air Quality Management Area (Windsor Road, Penarth). It was highlighted that it would be decided following the examination of the 2016 dataset whether to revoke the Windsor Road, Penarth AQMA. Three biomass boiler installations were investigated and it was ascertained if their emissions would breach targeted emission thresholds.

2017 Annual Progress Report

The Annual Progress Report confirmed that air quality within the Vale of Glamorgan continued to meet the relevant air quality objectives, including within the existing Air Quality Management Area (AQMA) on Windsor Road, Penarth. From the 44 locations monitored throughout the Vale Borough with the use of passive diffusion tubes, one site does breach the national annual objective of 40µg/m3 (Site ID 79), however as this site is described as a kerbside location and its nearest relevant exposure is that of a retail shop, therefore the 1-hour objective would only apply at this location. Detailed in the Local Air Quality Management (LAQM) TG(16), Paragraphs 7.90 & 7.91 focus on predicting exceedences of the NO_2 1-hour objective (**200µg/m3, not to be exceeded more than 18 times per year)** with the use of NO_2 diffusion tubes. It is stated that ***"exceedances of the NO2 1-hour mean are unlikely to occur where the annual mean is below 60µg/m3."*** Therefore, based on the 2016 datasets it can be concluded that the NO_2 1 hour objective was not breached.

Due to continual compliance over a three year period with the national air quality objectives set for NO_2 (annual average 40µg/m^3 & 1-hour average 200µg/m^3 not be exceeded more than 18 times per year), in accordance with Local Air Quality Management in Wales, Policy Guidance, June 2017, the report outlined that the Vale of Glamorgan Council wish to revoke the Windsor Road, Penarth AQMA. As required a supporting report would accompany the 2017 annual progress report which will highlight the continued compliance and will demonstrate compliance for future years for the defined AQMA area.

As part of Section 3.25 LAQM TG(16) it is a requirement to list any installations with the potential to impede on air quality with relevant exposure nearby. A planning application was approved in January 2016 for the construction of 12 log cabins and biomass house at the Walled Garden, Rosedew Farm, Llantwit Major. Using Defra's Screening Emissions Calculation Tools for Biomass Boilers and Industrial Sources the biomass installation was shown to be compliant with their derived emissions thresholds (please see Section 3.4).

The automatic monitoring station located at Dinas Powys Primary School was decommissioned at the start of 2016. The three co-located NO_2 diffusion tube tubes were no longer required and so one diffusion tube remained at this location. Diffusion tube site 86 was removed due to continued vandalism whereby the tube and its holder were continuously removed. Also as detailed in the last progress Report, 2016, site 56 has now been relocated to a location where results are indicative of relevant exposure, this being at a façade of a residential property.

Following a review of the 2016 NO_2 diffusion tube network, it was agreed to assign and relocate new monitoring locations. The new locations have been allocated based on known areas of particularly elevated traffic flows and foreseeable development, all with nearby relevant exposure. These newly monitored areas for 2017 are Llantwit Major, Gileston, St Athan, Rhoose (Fonmon), Barry Docks and Saint Brides Major.

1.2 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when air quality is close to or above an acceptable level of pollution (known as the air quality objective (Please see Appendix A)). After declaring an AQMA the authority must prepare a **DRAFT** Air Quality Action Plan (AQAP) within 18 months setting out measures it intends to put in place to improve air quality to at least the air quality objectives, if not even better. The AQAP must be **formally** adopted prior to 24 months has elapsed.

AQMA(s) are seen by local authorities as the focal points to channel resources into the most pressing areas of pollution as a priority.

Based on monitoring results and further detailed assessments, there is currently one Air Quality Management Areas (AQMAs) declared in The Vale District, declared due to exceedances of the annual mean NO_2 Air Quality Standard (40ug/m^3), known to be derived from road transport derived NO_2.

-Penarth, Windsor Road AQMA- declared 1st August 2013

Figure 1.2- Boundary of the Penarth, Windsor Road AQMA

1.3 Implementation of Action Plans

Due to the proposal to revoke the Penarth, Windsor Road AQMA, it is currently not necessary for the Vale of Glamorgan to produce an action plan. However if the Council is unable to successfully fulfil the requirements of Welsh Government and demonstrate future compliance with national air quality objectives then it will be necessary to revisit the Windsor Road AQMA and an appropriate Action Plan developed.

Although not formalised as an action plan, highlighted within the Executive Summary highlighted under the subsection "Actions to Improve Air Quality" there are a number of measures listed which do directly impact the designated Penarth, Windsor Road AQMA.

Welsh Government's Local Policy Guidance, "Local Air Quality Management in Wales" June 2017 states;

4.14 *Local Authorities wishing to revoke or reduce an AQMA* ***should only do so with the approval of the Welsh Government following a review and consultation with the local communities affected****. The review should* ***clearly demonstrate national air quality objectives are being met and will continue to be met****. In other words, the Local Authority* ***should have confidence the observed improvements will be sustained****. Typically this requires* ***three years or more of full compliance****, but once the revocation or reduction has been agreed by the Welsh Government,* ***it should occur without delay****. Following a revocation, the Local Authority should ideally put in place a local or regional air quality strategy to ensure air quality remains a high-profile issue and conditions are prevented from deteriorating in future.*

A separate report will be published following this Annual Progress Report which will underpin the decision to revoke the Windsor Road AQMA and will include a consultation on these proposals.

As outlined earlier within this report, the AQMA Revocation Decision Report will demonstrate existing compliant levels and ensure compliance for future years based on projected levels. The report will also highlight any suggestions and proposed works the VOG are committed to undertaking within the locality of Windsor Road.

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

2.1 Summary of Monitoring Undertaken in 2017

2.1.1 Automatic Monitoring Sites

The Vale Council operated one automatic monitor station during 2017.

As previously discussed, in 2018 SRS on behalf of the VOG has commissioned two near real-time indicative automatic monitors. The AQ Mesh analysers continuously monitor for Nitric Oxide, Nitrogen Dioxide & Ozone, PM10 & PM2.5, and do so every 15 minutes (data uploaded every hour). The data from the pod is sent to a cloud server where it is corrected for temperature, pressure and relative humidity as well as cross gas interference.

Penarth, Windsor Road

This monitor is operated by Shared Regulatory Services (SRS) on behalf of 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, PM_{10} and ozone (o_3) and forms part of the Welsh Air Quality Network. The station is calibrated by a Local Authority Officer on a fortnightly basis and serviced and maintained by an approved contractor on a six monthly basis following QA/QC checks. Data obtained from the monitor is checked for validation and ratified by Ricardo-AEA. For 2017, data capture for NO_2 was recorded at 95.4% and 89.4% for PM_{10}.

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. The bias adjustment factor derived from the co-location study was 0.66. 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 LAQM DEFRA website, based on 29 studies, which appointed ESG Didcot laboratory, was slightly higher at 0.77. 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.

Figure 2.1 Map of Penarth, Windsor Road Automatic Monitoring Site

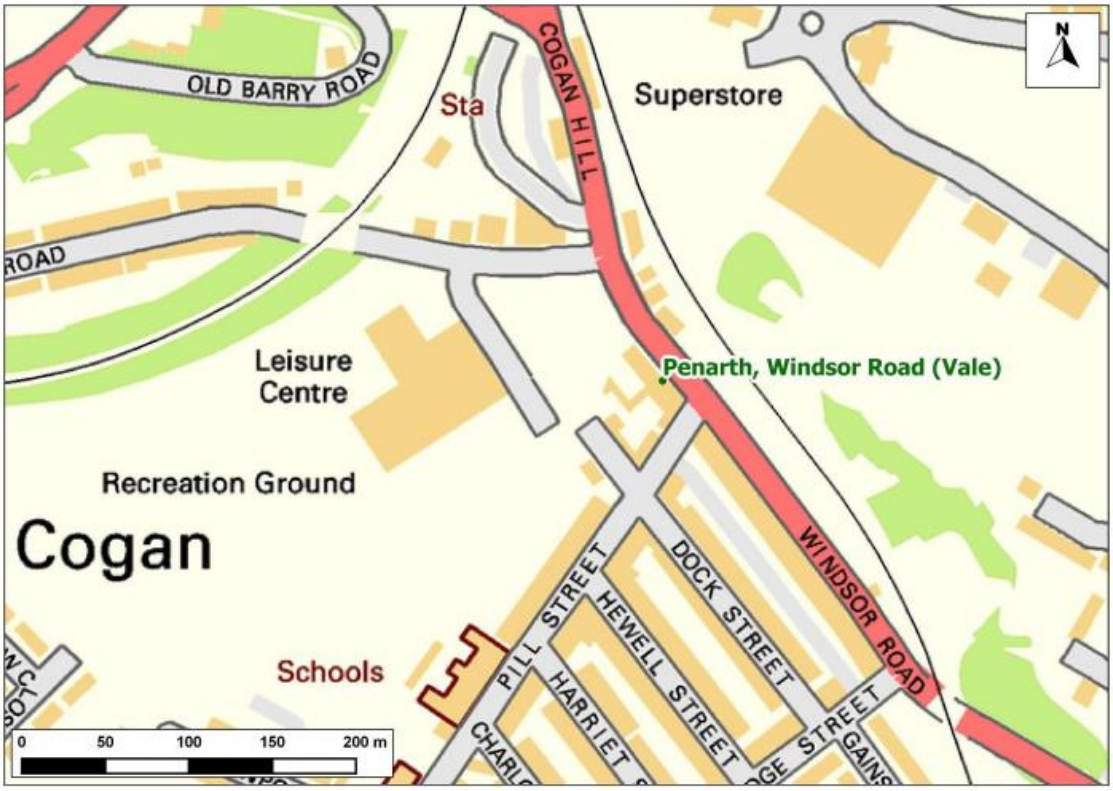


Table 2.1 Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Inlet Height (m)	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
Penarth, Windsor Road	Penarth, Windsor Road	Roadside	317598	172399	2.5	NO_2	Y	Chemiluminescent Analyser	Y (2m)	2m	Y
						PM_{10}		Beta Attenuation Monitor with Gravimetric Equivalence			
						O_3		UV absorption analyser			

2.1.2 Non-Automatic Monitoring Sites

Shared Regulatory Services (SRS) on behalf of the Vale of Glamorgan Council carries out monitoring of ambient air quality for Nitrogen Dioxide (NO_2). During the period since the Progress Report in 2017, monitoring of NO_2 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 2.2a- 2.2k.

NO_2 Diffusion Tube Locations

The location of the 6 areas where NO_2 monitoring has taken place;

a. Cowbridge (Area A)
b. Llantwit Major (Area B)
c. St Athan (Area C)
d. Gileston (Area D)
e. Rhoose (Area E)
f. Saint Brides Major (Area F)
g. Culverhouse (Area G)
h. Dinas Powys (Area H)
i. Llandough (Area I)
j. Penarth (Area J)
k. Barry (Area K)

Laboratory Methods and Analysis of Diffusion Tubes

Analysis of the exposed tubes is carried out by Environmental Scientifics Group Didcot operating procedure HS/GW1/1015, issue 10. The tubes are prepared by spiking acetone:triethanolomine (50:50) on the grids prior to the tubes being assembled. The tubes are desorbed with distilled water and the extract analysed using a segmented flow auto analyser with ultraviolet detection. As set out in the practical guidance the results were initially calculated assuming an ambient temperature of 11^{o}C and then adjusted to 20^{o}C to allow direct comparison with EU limits. The national bias correction factor for this laboratory was utilised as opposed to our own local co-location data. The reason for this was due to an inconsistent calibration record, whereby calibrations of the NOx analyser were not undertaken every two weeks, as outlined in LAQM (TG16). Adopting best practice, no local co-location was carried out and a bias correction factor of 0.77 was obtained and applied

using the DEFRA website, available using the following link; https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

Where valid data capture for the year is less than 75% (9 months), the continuous and NO_2 diffusion tube monitoring data have been ''annualised'' following the methods as described in Box 7.10 of LAQM (TG16).

Where an exceedance is measured at a monitoring site not representative of public exposure, NO_2 concentration at the nearest relevant exposure has been estimated based on the "NO_2 fall-off with distance" calculator (http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html). The procedure is described in LAQM. TG16 Section 7.77-7.79.

Figure 2.2a – AREA A – Cowbridge NO_2 Diffusion Tube Locations

Figure 2.2b – AREA B – Llantwit Major NO_2 Diffusion Tube Locations

Figure 2.2c – AREA C – Llantwit Major & St Athan NO_2 Diffusion Tube Locations

Figure 2.2d – AREA D – Gileston NO_2 Diffusion Tube Locations

Figure 2.2e – AREA E – Rhoose NO_2 Diffusion Tube Locations

Figure 2.2f – AREA F – Saint Brides Major NO_2 Diffusion Tube Locations

Figure 2.2g – AREA G – Culverhouse NO_2 Diffusion Tube Locations

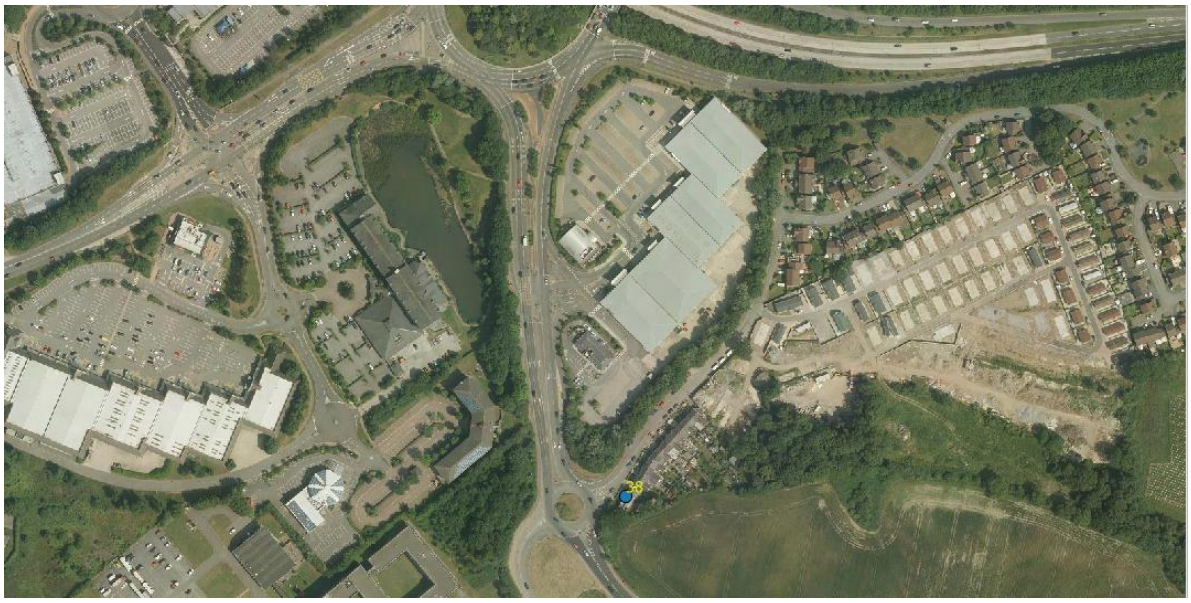


Figure 2.2h – AREA H – Dinas Powys NO_2 Diffusion Tube Locations

Figure 2.2i – AREA I – Llandough & Cogan NO_2 Diffusion Tube Locations

Figure 2.2j – AREA J – Penarth NO_2 Diffusion Tube Locations

Figure 2.2k – AREA K – Barry NO_2 Diffusion Tube Locations

Table 2.2- Details of Non-Automatic Monitoring Sites 2017

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	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	1.5	NO2	N	N	N (1.00)	1m	N
65	1 Riverside Mews, Cowbridge	Roadside	299614	174592	1.5	NO2	N	N	Y (0.00)	4m	Y
101	37 Westgate House	Kerbside	298903	174907	1.5	NO_2	N	N	Y (0.00)	0.75m	Y
LLANTWIT MAJOR											
93	Le Pouliguen Way	Roadside	297171	168741	1.5	NO2	N	N	Y (0.00)	4.8m	Y
94	5 Boverton Road	Roadside	297069	168715	1.5	NO2	N	N	Y (0.00)	7.4m	Y
95	Millands Caravan Park	Rural	298861	169236	1.5	NO_2	N	N	Y (0.00)	290m	Y
96	Old Froglands Farm	Suburban	299045	169126	1.5	NO_2	N	N	Y (0.00)	86m	Y
ST ATHAN											
97	7 Picketson Close	Urban Background	300460	169310	1.5	NO_2	N	N	Y (0.00)	30m	Y
GILESTON											
98	Orchard Way (Ivy Cottage)	Suburban/ Industrial	301899	167043	1.5	NO_2	N	N	Y (0.00)	450m	Y
RHOOSE											
99	Fonmon Road Lampost	Kerbside	304894	166898	1.5	NO_2	N	N	N (8.00)	0.9m	N
SAINT BRIDES MAJOR											
103	September Cottage	Roadside	289530	174896	1.5	NO2	N	N	Y (0.00)	6.5m	Y
104	Greengate Cottage	Roadside	289496	174858	1.5	NO2	N	N	Y (0.00)	12.5m	Y
105	St. Brides Primary School Walkway Entrance	Kerbside	289473	174752	1.5	NO_2	N	N	N (8.05)	0.95m	N
106	Dany Bryn House	Roadside	289454	174668	1.5	NO_2	N	N	Y (0.00)	2.1m	Y
107	Hillboro	Roadside	289512	174805	1.5	NO_2	N	N	Y (0.00)	7.5m	Y
CULVERHOUSE											

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	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?
38	2 Horseshoes	Roadside	311892	174513	1.5	NO2	N	N	Y (0.00)	2m	Y
DINAS POWYS											
7	Cardiff Road/Millbrook	Roadside	315773	171514	1.5	NO2	N	N	N (18.00)	2m	N
46	46 Cardiff Road	Roadside	315747	171369	1.5	NO2	N	N	Y (0.00)	5m	N
47	Dinas Powys Health Centre	Urban Background	315710	171385	1.5	NO2	N	N	N (4.00)	16m	N
61	Railway Terrace	Roadside	316433	171932	1.5	NO2	N	N	Y (0.00)	2m	Y
67	2 Matthew Terrace	Roadside	316488	172004	1.5	NO2	N	N	Y (0.00)	2.5m	Y
72a	Dinas Powys Infants School	Roadside	315841	171527	1.5	NO2	N	Y	Y (0.00)	7m	Y
89	9 Wayside Cottages, Cardiff Road	Roadside	316447	171963	1.5	NO2	N	N	Y (0.00)	3m	Y
90	16 Railway Terrace, Cardiff Road	Roadside	316453	171945	1.5	NO2	N	N	Y (0.00)	3m	Y
LLANDOUGH											
68	Glen View, 99 Penlan Road	Roadside	316886	172561	1.5	NO2	N	N	Y (0.00)	9m	Y
69	65 Penlan Road	Roadside	316847	172948	1.5	NO2	N	N	Y (0.00)	7.5m	Y
PENARTH											
22	Stanwell Road	Kerbside	318505	171496	1.5	NO2	N	N	N (8.00)	1m	N
29	Cogan Roundabout	Roadside	317406	172796	1.5	NO2	N	N	Y (0.00)	3m	N
53	168 Windsor Road	Roadside	317589	172411	1.5	NO2	Y	N	Y (0.00)	5m	Y

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	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?
55	159 Windsor Road	Roadside	317595	172435	1.5	NO2	Y	N	Y (0.00)	2m	Y
56	134 Andrew Road	Kerbside	316814	172443	1.5	NO2	N	N	Y (0.00)	10m	Y
62	154 Windsor Road	Roadside	317633	172357	1.5	NO2	Y	N	Y (0.00)	2m	Y
70	Ty-Isaf	Roadside	316731	172391	1.5	NO2	N	N	Y (0.00)	3m	Y
73a	Windsor Road Monitor 1	Roadside	317598	172399	1.5	NO2	Y	Y	2m	2m	Y
73b	Windsor Road Monitor 1	Roadside	317598	172399	1.5	NO2	Y	Y	2m	2m	Y
73c	Windsor Road Monitor 1	Roadside	317598	172399	1.5	NO2	Y	Y	2m	2m	Y
74	114 Windsor Road	Roadside	317708	172259	1.5	NO2	Y	N	Y (0.00)	2.5m	Y
76	160 Windsor Road	Roadside	317627	172371	1.5	NO2	Y	N	Y (0.00)	2.5m	Y
79	Marine Scene	Roadside	317549	172572	1.5	NO2	N	N	N (2.80)	1.2m	Y
82	98b Windsor Road	Roadside	318061	171944	1.5	NO2	N	N	Y (0.00)	8m	Y
88	134 Windsor Road	Roadside	317668	172312	1.5	NO2	Y	N	Y (0.00)	3.5m	Y
100	141 Plassey Street	Roadside	317968	172105	1.5	NO2	N	N	Y (0.00)	4.5m	Y
BARRY											
8	Tynewydd Road	Kerbside	311797	168503	1.5	NO2	N	N	N (4.00)	1m	N
41	Dispenser Road	Urban Background	315278	168451	1.5	NO2	N	N	N	128m	N
64	Holton Road	Roadside	311690	168042	1.5	NO2	N	N	Y (0.00)	3m	Y

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	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?
66	17 Churchill Terrace	Roadside	313342	168823	1.5	NO2	N	N	Y (0.00)	4m	Y
71	76 High Street (O'Donovans)	Roadside	310764	167505	1.5	NO2	N	N	Y (0.00)	2m	Y
83	24 Cardiff Road	Roadside	313597	168829	1.5	NO2	N	N	Y (0.00)	2.5m	N
102	Powell Dyfryn Way	Roadside	311115	167041	1.5	NO2	N	N	N (3.40)	1.0m	N

Notes:

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

2.2 2017 Air Quality Monitoring Results

Table 2.3 – Non-automatic Annual Mean NO_2 Monitoring Results (2013- 2017)

Site ID	Site Type	Valid Data Capture 2017 (%) (1)	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias (2)				
				2013 Bias Adjustment Factor = 0.95	2014 Bias Adjustment Factor = 0.91	2015 Bias Adjustment Factor = 0.88	2016 Bias Adjustment Factor = 0.78	2017 Bias Adjustment Factor = 0.77
COWBRIDGE								
54	Kerbside	100	N	26	21.5	22.4(2)	19.7/ 18.3(3)	19.5/ 15.5 (3)
65	Roadside	100	N	18	16.7	15.9	15.9	15.2
101	Kerbside	100	N	-	-	-	-	19.9
LLANTWIT MAJOR								
93	Roadside	92	N	-	-	-	-	11.3
94	Roadside	100	N	-	-	-	-	9.3
95	Rural	100	N	-	-	-	-	6.9
96	Suburban	92	N	-	-	-	-	9.4
ST ATHAN								
97	Urban Background	100	N	-	-	-	-	8.4
GILESTON								
98	Suburban/ Industrial	100	N	-	-	-	-	6.5
RHOOSE								
99	Kerbside	58	N	-	-	-	-	10.0 (2)
SAINT BRIDES MAJOR								
103	Roadside	92	N	-	-	-	-	10.0
104	Roadside	92	N	-	-	-	-	10.5
105	Kerbside	92	N	-	-	-	-	12.3/ 9.3 (3)
106	Roadside	92	N	-	-	-	-	9.4
107	Roadside	92	N	-	-	-	-	7.3

Site ID	Site Type	Valid Data Capture 2017 (%) (1)	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias (2)				
				2013 Bias Adjustment Factor = 0.95	2014 Bias Adjustment Factor = 0.91	2015 Bias Adjustment Factor = 0.88	2016 Bias Adjustment Factor = 0.78	2017 Bias Adjustment Factor = 0.77
CULVERHOUSE CROSS								
38	Roadside	92	N	24	25.9	23.3	25.9(2)	19.6
DINAS POWYS								
7	Roadside	100	N	28.5	26.3	24.6	25.5/ 20.7(3)	23.4/ 18.5 (3)
46	Roadside	100	**N**	22	19.7	18.6	18.7	17.1
47	Urban Background	83	N	17.5	15.6	14.4	13.5	11.6
61	Roadside	100	N	34.6	31	30.1	31.5	30.4
67	Roadside	100	N	30	26	24.2	24.8(2)	21.4
72a	Roadside	100	N	24.1	27.8	23.8	21.9(2)	19.9
89	Roadside	100	N	34	31.2	30.8	31.8	28.3
90	Roadside	100	N	27	24.6	21.4	21.2	19.7
LLANDOUGH								
68	Roadside	100	N	20.9	16.9	16.4	17.3	**15.1**
69	Roadside	92	N	19.8	19.6	17.2	18.1	**16.6**
PENARTH								
22	Kerbside	100	N	26	24.4	23.7	23.6/ 20.0(3)	21.8/ 18.2 (3)

Site ID	Site Type	Valid Data Capture 2017 (%) (1)	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias (2)				
				2013 Bias Adjustment Factor = 0.95	2014 Bias Adjustment Factor = 0.91	2015 Bias Adjustment Factor = 0.88	2016 Bias Adjustment Factor = 0.78	2017 Bias Adjustment Factor = 0.77
29	Roadside	100	N	35.4	32.9	31.8	34.4	31.4
53	Roadside	100	Y	33	31.2	30.8	31.5	29.8
55	Roadside	92	Y	33	27.1	27.7	28.9	26.3
56	Kerbside	100	N	38.5	33.9	**40.3/** 29.4(3)	17.5(2)	23.2
62	Roadside	100	Y	36	33.9	31.7	33.2	31.2
70	Roadside	92	N	19	21.9	23.2	24.6	20.3
73a	Roadside	100	Y	28	28.3	30.2	32.0	31.0
73b	Roadside	100	Y	28	28.3	29.8	31.0	30.6
73c	Roadside	100	Y	28	28.3	30	31.2	30.5
74	Roadside	83	Y	31	29.6	28	28.2	28.4
76	Roadside	100	Y	N/A	33.9	32	32.4	30.7
79	Roadside	92	Y	**42**	39.6	37.5	**44.4/** 37.2(3)	38.3/ 32.3 (3)
82	Roadside	100	N	21	19.6	17.4	18.0	16.9
88	Roadside	100	Y	34	33.5	30.7	31.4	29.8

Site ID	Site Type	Valid Data Capture 2017 (%) (1)	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias (2)				
				2013 Bias Adjustment Factor = 0.95	2014 Bias Adjustment Factor = 0.91	2015 Bias Adjustment Factor = 0.88	2016 Bias Adjustment Factor = 0.78	2017 Bias Adjustment Factor = 0.77
100	Roadside	100	N	-	-	-	-	23.9
BARRY								
8	Kerbside	75	N	27	32.4	33.6(2)	23.5(2)	31.9/ 25.3 (3)
41	Urban Background	100	N	15	13.1	13.1	14.5(2)	11.5
64	Roadside	75	N	21	20.2	20.8(2)	20.4(2)	17.5
66	Roadside	100	N	33	30.2	30.9	27.7	30.4/ 24.3 (3)
71	Roadside	92	N	19	17.8	18.4	17.9(2)	16.7
83	Roadside	42	N	27	23.2	23.2	24.9	27.5 (2)
102	Roadside	50	N	-	-	-	-	17.4 (2)

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

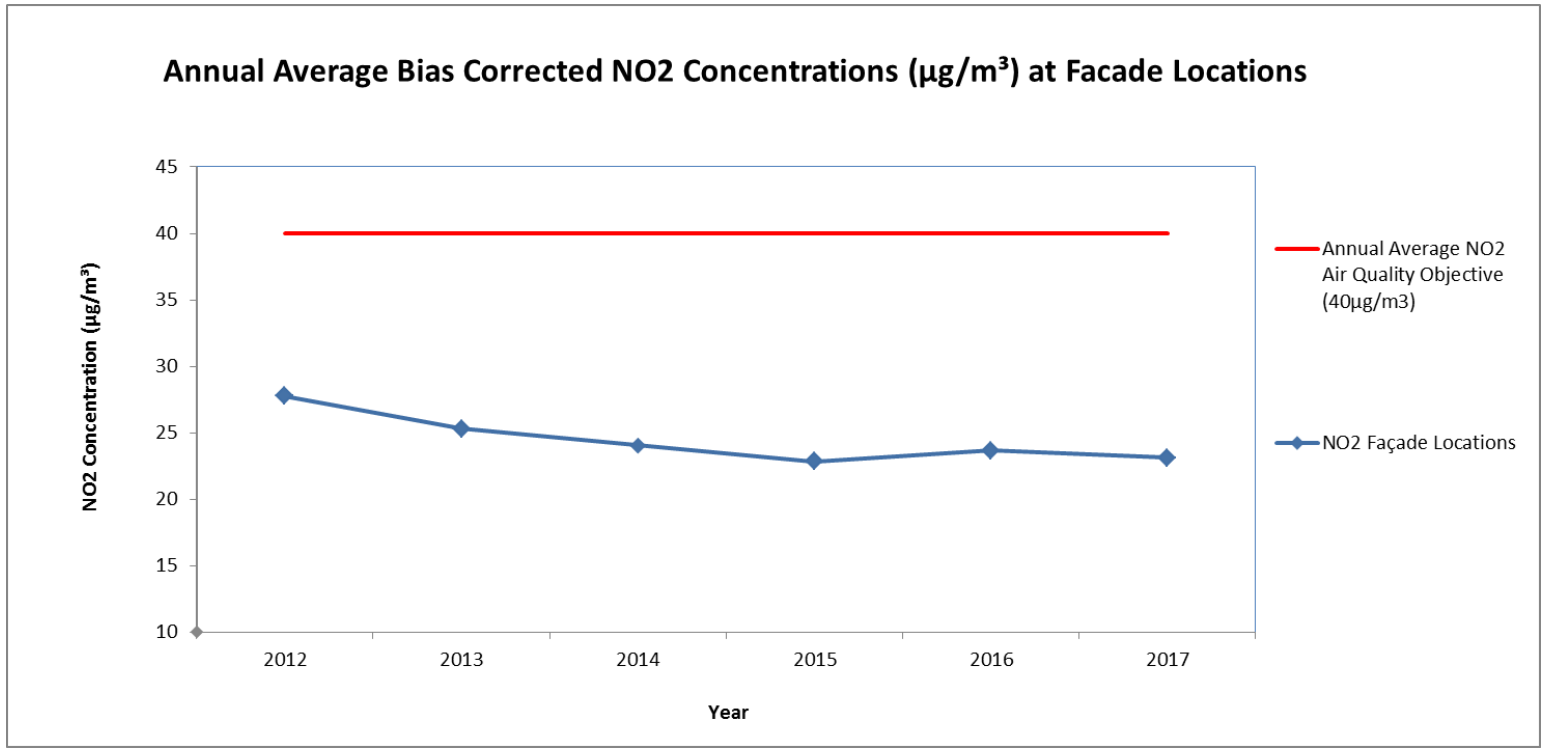
NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

(1) 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%).

(2) Diffusion tube data has been "bias adjusted" in accordance with Box 7.11 in LAQM.TG16 and "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(3) Diffusion tube data has been corrected for distance to represent relevant exposure in accordance with Sections 7.77- 7.79 in LAQM.TG16 "Fall-off in NO2 concentrations with Distance from the Road"

Figure 2.3 – Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites



The graph represents annual average bias corrected NO_2 data since 2012. The locations examined represent worst case exposure due to the fact monitoring was undertaken at residential façade locations. The displayed average datasets indicate **compliant** NO_2 results for the Vale in general since 2012. The results are somewhat stable with a decreasing trend. As the network of diffusion tubes were amended for 2017 the graph does not capture a few previously included sites as these were decommissioned for 2017's monitoring

Table 2.4 – Automatic Annual Mean NO_2 Monitoring Results (2013- 2017)

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % (1)	Valid Data Capture 2017 % (2)	Annual Mean Concentration (µg/m^3)				
					2013	2014	2015	2016	2017
Penarth, Windsor Road	Roadside	Y	100	95.4	-	27.7	26.5	28.3	26.5

Notes:
Exceedances of the Annual Average NO2 objective (40µg/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) Data has been "annualised" as per Boxes 7.9 in LAQM.TG16 where valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table 2.5 –Automatic 1-hour Mean NO_2 Monitoring Results (2013- 2017)

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % (1)	Valid Data Capture 2017 % (2)	Number of Hourly Means (> 200µg/m^3)(3)				
					2013	2014	2015	2016	2017
Penarth, Windsor Road	Roadside	Y	100	95.4	-	0(86)	0	0	0

Notes:
Exceedances of the NO_2 1-hour mean objective (200µg/m^3 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.

Figure 2.4 – Trends in Annual Mean NO_2 Concentrations Recorded at Windsor Road Automatic Monitoring Site

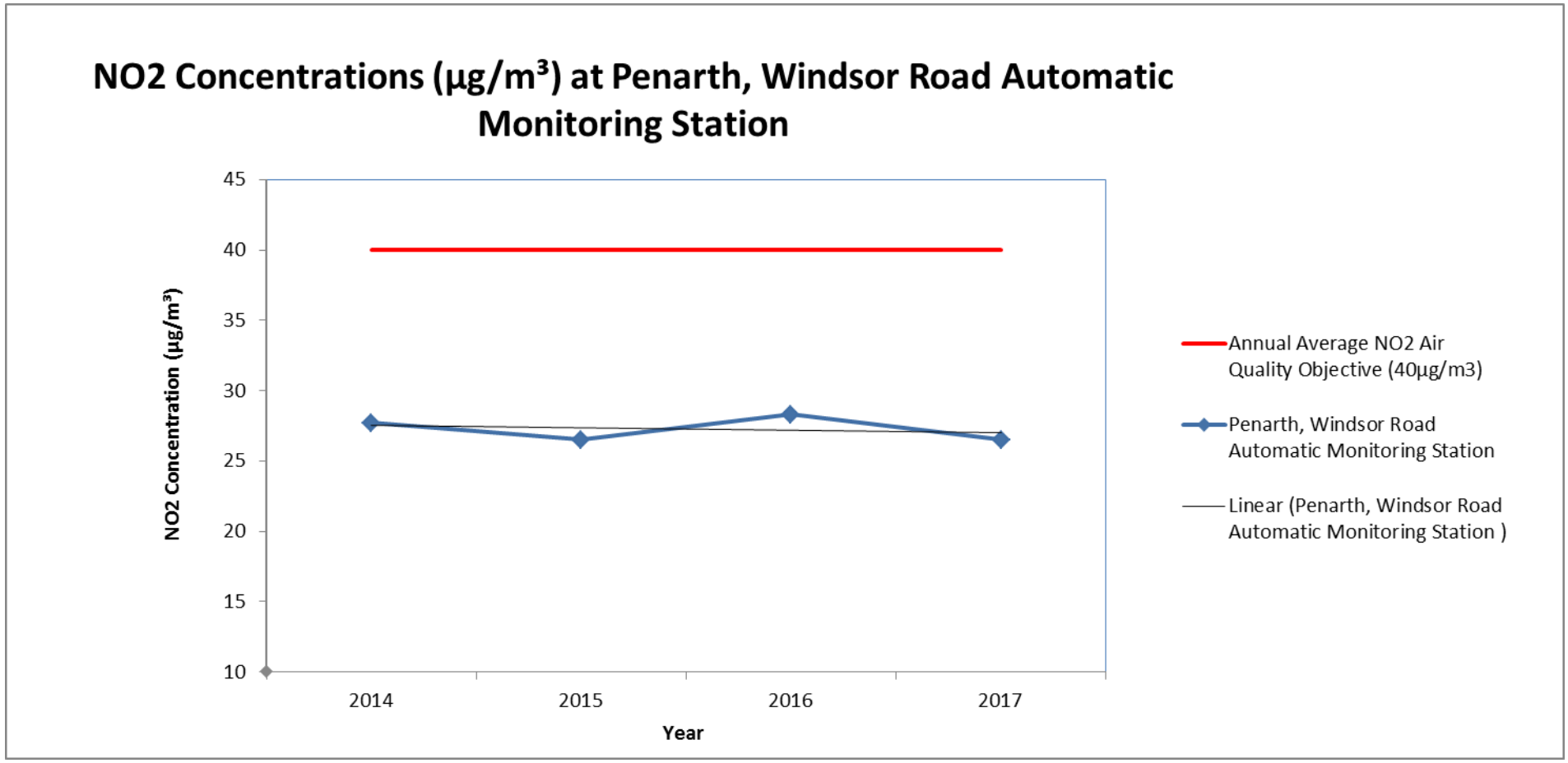


Table 2.6 – Automatic Annual Mean PM_{10} Monitoring Results (2013- 2017)

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	Confirm Gravimetric Equivalent (Y or N/A)	PM_{10} Annual Mean Concentration (µg/m^3) (3)				
						2013	2014	2015	2016	2017
Penarth, Windsor Road	Roadside	Y	100	89.4	Y	-	17.5(3)	20.8	21.4	15.6

Notes:
Exceedances of the PM_{10} annual mean objective of 40µg/m^3 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) Data has been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16 where valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table 2.7 – Automatic 24-Hour Mean PM_{10} Monitoring Results (2013- 2017)

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg/m^3 (3)				
						2013	2014	2015	2016	2017
Penarth, Windsor Road	Roadside	Y	100	89.4	Y	-	0 (20.7)	4 (31.2)	1 (31.9)	2

Notes:
Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 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 90.4th percentile of 24-hour means is provided in brackets.

Figure 2.5 – Trends in Annual Mean PM_{10} Concentrations Recorded at Windsor Road Automatic Monitoring Site

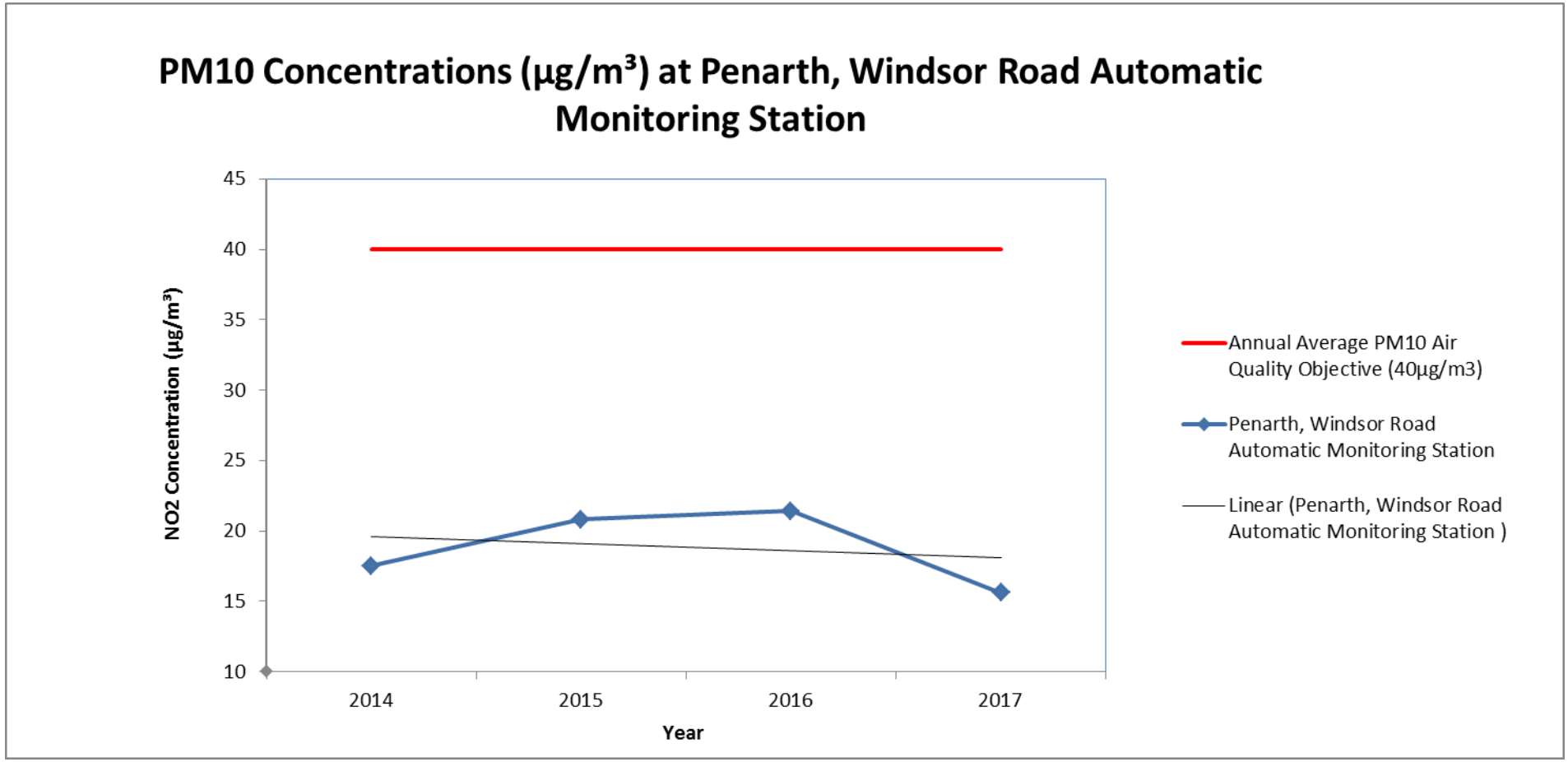


Table 2.8 – Automatic Ozone (O3) Monitoring Results: Comparison with Objectives

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	Number of Exceedences
					Number of days where the 8-hour mean >100µg/m^3
Penarth, Windsor Road	Roadside	Y	100	91.6	0

Notes

(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%).

2.3 Comparison of 2017 Monitoring Results with Previous Years and the Air Quality Objectives

During 2017 monitoring was carried out for nitrogen dioxide (NO_2), particulate matter (PM_{10}), and ozone (O3).

2.3.1 Nitrogen Dioxide (NO_2)

Nitrogen dioxide was measured during 2017 at one site equipped with an automatic NOx analyser and by a network of 49 passive diffusion tubes.

In order to ratify the 2017 diffusion tube dataset, a bias adjustment factor of 0.77 was applied to the annual average readings. The factor was derived from the Defra website which gave the average correction factor from 29 co-location studies across the UK, whereby the analytical laboratory and method used was the same as the VOG. The national bias correction factor was utilized as it would provide results representative of a worst case scenario. The bias correction factor of 0.77 was obtained from the following website: http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

Automatic Monitoring Data

Monitoring of NO_2 has continued to be carried out at the Penarth, Windsor Road site. As previously discussed, 2018 saw the introduction of two near real time automated indicative monitoring commissioned by the VOG and installed in the Barry area.

Datasets obtained from the Penarth, Windsor Road site have been cross referenced to the annual and 1-hour average objectives set for NO2. The findings summarised in **Tables 2.4 & 2.5** indicate compliance with both objectives.

Non- automated Monitoring Data

The nitrogen dioxide diffusion tube data is summarised in Table 2.3. The full dataset (raw monthly mean values) is included in Appendix A. All data displayed in Table 2.3 has been bias adjusted and where necessary annualised in accordance with Box 7.10 of LAQM TG(16), as well corrected for distance to the nearest sensitive receptor. Evidence of the sites annualised can be seen in Appendix C. The applied bias adjustment factor was 0.77, as described in Appendix C.

As outlined by Table 2.3; the nitrogen dioxide concentrations measured by the passive diffusion tubes show that there were no exceedences of the national air quality objectives for NO_2 (annual average

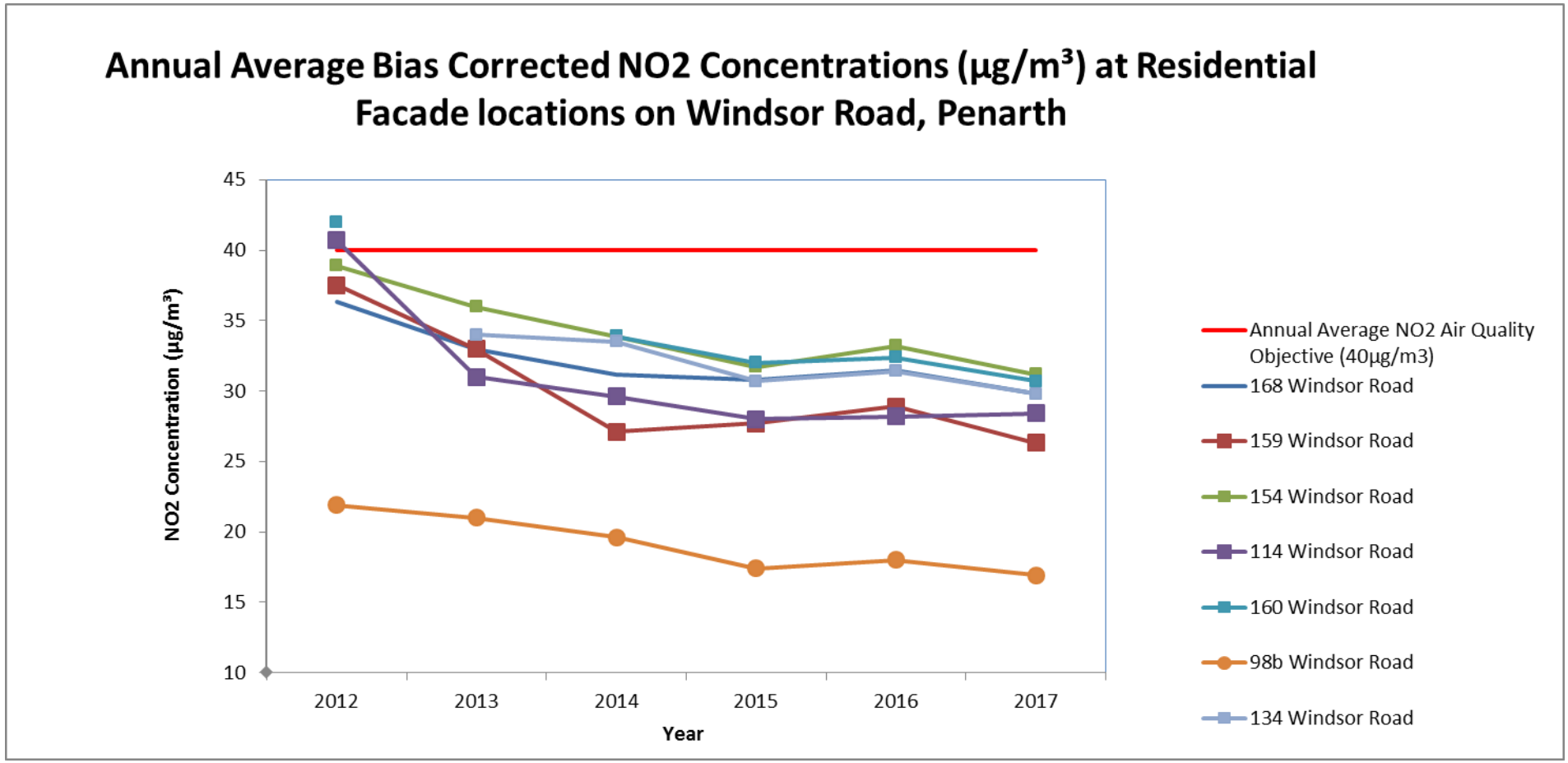
40µg/m^3 & 1-hour average 200µg/m^3 not be exceeded more than 18 times per year). In accordance with LAQM best practise guidance; there are no monitoring sites in the district with annual average concentrations above 60µg/m^3 in 2017. Therefore this indicates it is unlikely that the hourly nitrogen dioxide objective was exceeded.

In 2018 the existing monitoring network has been sufficiently review with 23 new locations implemented.

As previously detailed, due to continual compliance with the national air quality objectives set for NO_2 the Vale of Glamorgan Council will produce a proposal to revoke the Windsor Road, Penarth AQMA.

Figure 2.6 illustrates the annual average NO_2 datasets recorded at residential facades within the Windsor Road AQMA. The graph indicates compliance with the annual average objective at every monitored location since 2013.

Figure 2.6- Trends in Annual Average NO_2 Concentrations Recorded at Façade Locations on Windsor Road, Penarth



2.3.2 Particulate Matter (PM_{10})

Continuous monitoring of PM_{10} 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 PM_{10} data from Windsor Road monitor has been provided as gravimetric equivalence (by applying the conversion factor of 0.83 as stipulated in Section 7.151 TG(16)). The results are presented in Tables 2.6 & 2.7.

The results of the monitoring indicate that recorded PM_{10} concentrations at the Windsor Road monitoring station are compliant with both the annual mean (40µg/m^3) and 24-hour mean (>50 µg/m^3 not to be exceeded more than 18 times per year) AQS objectives set for PM_{10}.

2.3.3 Other Pollutants Monitored

Ozone (O_3)

The Vale monitors Ozone due to its potential correlations with other pollutants. In 2017, 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 2.8 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 2017.

2.4 Summary of Compliance with AQS Objectives as of 2017

SRS have reviewed the results from the monitoring undertaken across the Vale of Glamorgan area in 2017.

The automated and non- automated datasets show compliance with the AQS objectives at **all locations.**

Based on continued compliance over a three year period with the national air quality objectives set for NO_2 (annual average 40µg/m^3 & 1-hour average 200µg/m^3 not be exceeded more than 18 times per year), in accordance with Local Air Quality Management in Wales, Policy Guidance, June 2017, the Vale of Glamorgan Council wish to revoke the Penarth, Windsor Road AQMA.

3. New Local Developments

3.1 Road Traffic Sources (& other transport)

SRS on behalf of VOG continue to work and engage with the Transport and Highways team in the Council, consulting upon any road network proposals that have the potential to influence local air quality levels.

3.1.1 Narrow Congested Streets with Residential Properties Close to the Kerb

SRS on behalf of the VOG has considered road traffic sources extensively in both this and earlier reports; the monitoring network is very largely focused on measuring concentrations of nitrogen dioxide close to many of them. These have been discussed either in previous reports or earlier in this report.

There are no newly identified road traffic sources which need to be considered.

For 2017 SRS on behalf of the VOG 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

As detailed in the 2017 APR the non-automatic monitoring network of diffusion tubes were revised and amended. As part of this revision areas including Llantwit Major and Saint Brides Major were encapsulated in the monitoring. The monitoring locations in Llantwit Major and Saint Brides Major do feature commercial dwellings whereby somebody may spend 1-hour or more close to traffic. As previously indicated the annual average datasets recorded at these locations show compliance with the national NO2 air quality objectives at these locations.

There are no new locations identified since the Council's 2017 Progress Report was submitted and there is no need to consider this further at this time.

SRS on behalf of the VOG 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 HGVs.

SRS on behalf of the VOG confirms that there are no new/newly identified roads with high flows of buses/HDVs.

3.1.4 Junctions

Junctions have been fully considered in previous annual reviews and assessments.

SRS on behalf of the VOG can confirm that there are no new/newly identified busy junctions/busy roads where exceedences of either the NO_2 or PM_{10} objectives are likely.

3.1.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

Northern Access Road

SRS on behalf of the VOG can confirm, following approval in late 2017, construction works have begun for the Northern Access Road (NAR) which will provide a link from the B4265 near Llantwit Major in the west to Eglwys Brewis Road in Picketston in the east. As previously outlined in the 2017 APR, as highlighted by the supporting air quality assessment (AQA)

Predicted annual mean NO_2 and Particulate Matter (PM10 and PM2.5) concentrations are expected to be well below the annual mean objective at all receptors in the study area. Overall, receptors are predicted to experience a negligible effect in accordance with the Institute of Air Quality Management (IAQM) /Environmental Protection UK (EPUK) guidance (2015), which is considered to be not significant, in both the opening year of 2019 and the future year of 2034.

The AQA did indicate a degree of risk identified with respect to dust and PM_{10} as a result of construction phase activities. The report states;

> ***"There are estimated to be between ten and 100 dust sensitive properties within 20 m of potential construction work areas within the Site. The sensitivity of the area to dust soiling due to the construction activity is therefore considered to be high***."
>
> ***"The medium dust emission magnitude coupled with the high sensitivity to property and amenity effects suggests that the risk of dust impacts to property and amenity due to construction activity is medium."***

In response to these findings a pre commencement planning condition was implemented;

Condition: Dust Control

Prior to the commencement of development a scheme (Construction Environmental Management Plan) to minimise dust emissions arising from demolition and construction activities on site shall be submitted to and approved in writing by the Local Planning Authority. The scheme shall include details of dust suppression measures and the methods to monitor emissions of dust arising from the development. The construction phase shall be implemented in accordance with the approved

scheme, with the approved dust suppression measures being maintained in a fully functional condition for the duration of the construction phase.

Reason: To assess air quality and agree any mitigation measures that may be required to safeguard the amenity of nearby residents in the area.

The CEMP has now been received and condition accepted.

Non-automatic NO_2 diffusion tube monitoring has continued at specific sensitive receptor locations in the vicinity of the proposed development.

A4226 '5 Mile Lane' road infrastructure improvement works

The A4226 (Five Mile Lane) connects Barry at the Waycock Cross roundabout with the Sycamore Cross junction on the A48, and comprises an essential part of the highway network leading to the Enterprise Zone. The proposed Five Mile Lane Highway Improvements stem from the Welsh Government's proposals to trunk the route Culverhouse Cross – Sycamore Cross – Five Mile Lane – Airport. The Council has previously received a Principal Road Grant from the Welsh Government to advance the Five Mile Lane Highway Improvement Scheme, and to date this work has involved the signalisation of Sycamore Cross junction, as well as initial design and feasibility work together with various environmental assessments.

In 2018 works have initiated for the improvement works on the A4226.

3.1.6 Roads with Significantly Changed Traffic Flows

The criteria for assessing roads with significantly changed traffic flows are set out in Table 7.1, row/point 6 of TG(16) (Defra, 2016). Predictions of increased traffic do not approach 25% on roads with more than 10,000 vpd.

SRS on behalf of the VOG confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.1.7 Bus and Coach Stations

SRS on behalf of the VOG confirms that there are no relevant bus stations in the Local Authority area.

3.1.8 Airports

The criteria for assessing airports are set out in Section 7.16 of TG(16) (Defra, 2016). The Vale confirms that there are two airports in the Local Authority area: Cardiff Wales Airport and MOD St Athan. Neither of these airports meets the criteria for further consideration.

SRS on behalf of the VOG confirms that there are no airports meeting the criteria in the Local Authority area.

3.1.9 Railways (Diesel and Steam Trains)

LAQM.TG(16) suggests that SO_2 emissions from diesel locomotives may be significant if there are outdoor locations where locomotives are regularly stationary for more than 15minutes and where members of the public could be regularly exposed over this period at such locations.

LAQM.TG(16) also requires consideration exposure to nitrogen dioxide within 30m of certain specified railway lines in those areas where the annual mean background concentration is above 25µgm^{-3}.

Stationary Trains

SRS on behalf of the VOG 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

LAQM.TG(09) introduced a new requirement to assess the potential for exceedence of nitrogen dioxide objectives. The assessment criteria are in relation to large numbers of diesel locomotive movements where there is relevant exposure within 30metres of the track in areas where the background annual mean concentration of nitrogen dioxide is above 25µm^{-3}.

SRS on behalf of the VOG confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

3.1.10 Ports (Shipping)

SRS on behalf of the VOG confirms that there are no ports or shipping that meets the specified criteria within the Local Authority area.

3.2 Industrial / Fugitive or Uncontrolled Sources / Commercial Sources

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

Biomass Gasification Facility, Woodham Road, Barry

As previously declared in the 2017 APR; on the 31st July 2015 the Vale Council approved planning permission for the construction and operation of a biomass gasification facility at Woodham Road, Barry, CF63 4JE (Grid Reference ST 12610 67683). It was noted in the 2017 APR that Natural Resources Wales (NRW) were going through a second round of consultation in regards to a permit application for the proposed operation, submitted by Biomass UK NO.2 Ltd. This second round of consultation was formed as a result of a Section 5 amendment direction sanctioned by NRW; "NRW Schedule 5 notice re Biomass requesting more information" dated 4 May 2017. As part of the amendment a revised air quality assessment (AQA) was submitted in July 2017. Following much dialogue involving comments passed by SRS on behalf of VOG, NRW granted approval for the sites permit application in February 2018.

Cog Moors Wastewater Treatment Works

In the late part of 2017 a full permission was sought after for the following proposal;

2017/01203/FUL- for the change of use of land as an extension to the existing wastewater treatment works site and the construction of an Advanced Anaerobic Digestion (AAD) Plant, together with associated landscaping and mitigation measures and the formation of a temporary construction compound at Cog Moors Wastewater Treatment Works (WwTW), Cardiff Road, Dinas Powys.

Supporting AQA was submitted in accordance with the referenced planning application. The assessment concluded;

The results of the pollution model indicate that the AAD plant will not lead to exceedances of air pollution thresholds, and pollution levels are expected to be well below human health based thresholds with the plant in operation. The emissions from the AAD plant are also predicted to have no significant effects on ecology and habitats.

The application was approved in 2018.

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

SRS on behalf of the VOG can confirm 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.

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

There are no new or significantly changed industrial installations for which previous air quality assessments have not been carried out and which could give rise to potentially significant emissions of regulated pollutants either within the Vale or within neighbouring local authorities.

SRS on behalf of the VOG can confirm that there are new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

3.2.4 Major Fuel (Petrol) Storage Depots

SRS on behalf of the VOG can confirm that there are major fuel (petrol) storage depots within the Local Authority area, but these have been considered in previous reports.

3.2.5 Petrol Stations

There are no new petrol stations in the Vale District with throughputs greater than 2000m^3 per annum with a busy road nearby where there is relevant exposure within 10m of the pumps.
It is not necessary, therefore, to consider this further.

SRS on behalf of the VOG can confirm that there are no petrol stations meeting the specified criteria**.**

3.2.6 Poultry Farms

The criteria for assessing poultry farms are set out in Table 7.3, point 4 of TG(16) (Defra, 2016). No farms exceeding the relevant criteria (turkey units with greater than 100,000 birds, naturally ventilated units with greater than 200,000 birds or mechanically ventilated units with greater than 400,000) have been identified.
SRS on behalf of the VOG can confirm that there are no poultry farms meeting the specified criteria.

3.3 Commercial and Domestic Sources

3.3.1 Biomass Combustion – Individual Installations

As highlighted in Section 3.2.1 a permit application for the biomass gasification facility at Woodham Road, Barry was approved by Natural Resources Wales (NRW). At the time of writing this report the plant is not fully operational, therefore updates on the facility will be included in the 2019 APR for The Vale. Owing to the fact that the plant has been issued an Environmental Permit, all operational aspects of the plant are regulated by NRW, including the emissions to air scheduled as approved in the permit.

As part of Section 3.27 LAQM TG(16) it is a requirement to list any installations with the potential to impede on air quality with relevant exposure nearby. A planning application was approved in April 2017 for the construction of a new containerised biomass boiler plant, comprising of 3x biomass boilers, storage of pellets, control equipment and associated plant. The site proposed for the works is at The Docks Office, Subway Road, Barry.

Following LAQM TG(16) and using Defra's Screening Emissions Calculation tools for the calculation of actual and targeted emission rates, the need for further detailed assessments was evaluated. In this instance, the proposed facility indicated that actual emission rates were below the targeted emission rates, therefore both could be confidently screened out.

Docks Office, Subway Road, Barry

Boiler make: Windhager BioWIN Excel

Boiler capacity: 180kWh

Emission Certificate: Attached in Appendix D

Table 3.1: Screening Out Study Docks Office, Subway Road, Barry

Parameter	PM_{10}	$PM_{2.5}$	Annual Mean NO_2	1-Hour Mean NO_2
Actual Emissions g/s	0.0014	0.0014	0.014	0.014
Targeted Emissions g/s	0.01	0.01	0.05	0.05

3.3.2 Biomass Combustion – Combined Impacts

Previous reports have confirmed that there are no known areas in The Vale District where coal or solid fuel burning provides a significant level or primary household heating. Nothing has changed in this regard since the 2017 APR, despite the potential for increasing popularity of solid fuel heating with increased fossil-fuel prices, and there is no need to consider this further at this time.

SRS on behalf of the VOG can confirm that there are no biomass combustion plants in the Local Authority area.

3.3.3 Other Sources

3.3.4 Domestic Solid-Fuel Burning

Previous reports have confirmed that there are no known areas in The Vale District where coal or solid fuel burning provides a significant level or primary household heating. Nothing has changed in

this regard since the 2017 APR, despite the potential for increasing popularity of solid fuel heating with increased fossil-fuel prices, and there is no need to consider this further at this time.

It should be noted that the Council receives a number of enquiries each year from residents in respect of national or local requirements were they to wish to install log-burners or similar appliances in their homes. There are no smoke control areas in The Vale and hence no legal requirements with regard to appliances that may be installed. However, residents are always reminded of the legislation in respect of statutory smoke nuisance and, where they can't be persuaded otherwise for reasons of air quality and health, recommended to seek out an appliance certified for use in a smoke control area.

SRS on behalf of the VOG can confirm that there are no areas of significant domestic fuel use in the Local Authority area.

3.4 New Developments with Fugitive or Uncontrolled Sources

There are no new locations where fugitive could occur which have not been covered by previous rounds of review and assessment and no locations where new relevant exposure has been introduced to existing locations.

It is not considered necessary to consider this further at this time.

SRS on behalf of the VOG can confirm that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

3.5 Planning Applications

2017/01136/HYB- St Cyres School, Murch Crescent, Dinas Powys Residential Development

Full application for residential development for 215 units, highways and drainage infrastructure and associated landscaping; and Outline application in respect of the community and recreational use zone.

The referenced proposal was received in 2017 and following review of the submitted documentation was approved at the start of 2018.

An AQA was submitted as part of the proposal.

The main outcomes to be drawn from the AQA report are;

1. The operational impact of the Proposed Development on existing receptors is predicted to be “negligible”
2. For the construction phase, the most important consideration is dust. Without appropriate mitigation, dust could cause temporary soiling of surfaces, particularly windows, cars and laundry. The mitigation measures provided within this report should ensure that the risk of adverse dust effects is reduced to a level categorised as “not significant”.

With regards to the element of risk associated with the construction phase of the development, it is therefore considered essential that a suitable Construction Environmental Management Plan outlining a detailed Dust Management Plan with appropriate measures be submitted and approved prior to the development proceeding.

Condition: Dust Control

Prior to the commencement of development a scheme (Construction Environmental Management Plan) to minimise dust emissions arising from demolition and construction activities on site shall be submitted to and approved in writing by the Local Planning Authority. The scheme shall include details of dust suppression measures and the methods to monitor emissions of dust arising from the development. The construction phase shall be implemented in accordance with the approved scheme, with the approved dust suppression measures being maintained in a fully functional condition for the duration of the construction phase.

Reason: To assess air quality and agree any mitigation measures that may be required to safeguard the amenity of nearby residents in the area.

2017/00564/FUL- Northern Access Road

As this application relates to construction of a new road this has been detailed in Section 3.1.5. above .

4. Polices and Strategies Affecting Airborne Pollution

4.1 Air Quality Planning Policies

Local Development Plan (LDP) 2011- 2026.

On the 28th June 2017 the Council adopted the Vale of Glamorgan Local Development Plan 2011-2026. The LDP became operative on its adoption and supersedes the previous adopted Unitary Development Plan (UDP). The LDP will be the basis for decisions on land use planning in the Vale of Glamorgan and will be used by the Council to guide and manage new development proposals.

The Plan sets out the vision, objectives, strategy and policies for managing development in the Vale of Glamorgan, and contains a number of local planning policies and makes provision for the use of land for the purposes of housing, employment, retailing, recreation, transport, tourism, minerals, waste, and community uses. It also seeks to identify the infrastructure that will be required to meet the growth anticipated in the Vale of Glamorgan up to 2026, and provides a monitoring framework for assessing the effectiveness of the Plan.

Also highlighted within the LDP document is Policy **MD7** (Environmental Protection);

POLICY MD7 -

ENVIRONMENTAL PROTECTION

Development proposals will be required to demonstrate they will not result in an unacceptable impact on people, residential amenity, property and / or the natural environment from either:

1. Pollution of land, surface water, ground water and the air;
2. Land contamination;
3. Hazardous substances;
4. Noise, vibration, odour nuisance and light pollution;
5. Flood risk and consequences;
6. Coastal erosion or land stability;
7. The loss of the best and most versatile agricultural land; or
8. Any other identified risk to public health and safety.

Where impacts are identified the Council will require applicants to demonstrate that appropriate measures can be taken to minimise the impact identified to an acceptable level. Planning conditions may be imposed or legal obligation entered into, to secure any necessary mitigation and monitoring processes.

Featured as a main objective of the adopted LDP;

Objective 4- To protect and enhance the Vale of Glamorgan's historic, built and natural environment

4.8 The historic, built and natural environment of the Vale of Glamorgan is highly valued by residents and visitors and includes European, National and local designations which provide local identity and distinctiveness and present opportunities for recreation and tourism. The LDP will ensure that these natural and built environmental assets are protected, conserved and where appropriate enhanced as an important resource for local people and which attract visitors and contributes to the local economy.

4.3 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.

4.2 Active Travel Plans and Strategies

Walking and Cycling

Walking and Cycling are sustainable and practical alternatives to the private car, supporting healthy lifestyles and reducing the impact on the environment. An essential element in encouraging an increase in walking and cycling is the provision of a network of high quality dedicated routes that link communities and provide access to local retail, employment and recreation opportunities. The LDP will seek to encourage and give priority to those proposals that enhance opportunities for walking and cycling.

The LDP includes the following policy which draws upon specific projects targeted for the Vale District;

POLICY MG16 – TRANSPORT PROPOSALS
WALKING AND CYCLING

1. National Cycle Network Route 88 and associated local urban and rural connections
2. A4050 Port Road to Cardiff Airport.
3. A48 Culverhouse Cross to Bridgend.
4. Eglwys Brewis Road in conjunction with the proposed Northern Access Road, St Athan Enterprise Zone.
5. Barry waterfront to Dinas Powys.

The Council has a long standing commitment to develop the National Cycle Network within the Vale of Glamorgan. NCN Route 88 links NCN Route 4 at Margam Park in the County Borough of Bridgend, through the Vale of Glamorgan to the start of NCN Route 8 in Cardiff Bay. A feasibility study that identifies an indicative but preferred route for NCN 88 has been prepared for the Vale of Glamorgan Council by Sustrans and this is shown on the LDP Proposals Map, found using the following link;

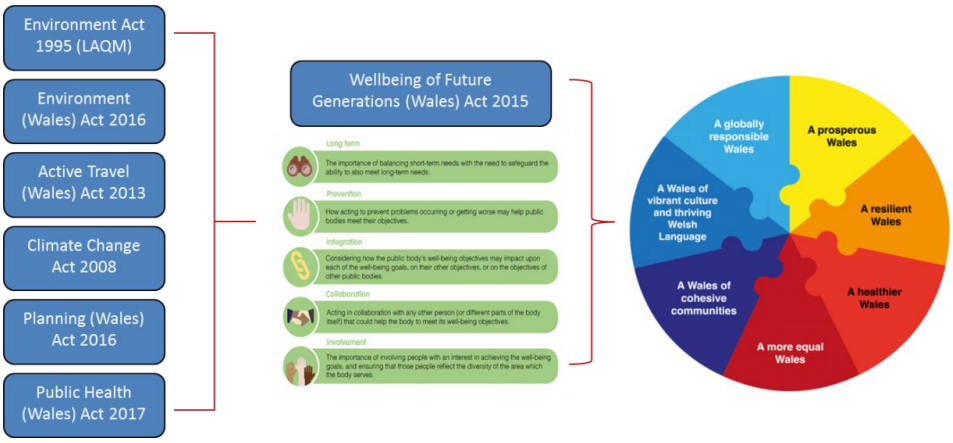
http://www.valeofglamorgan.gov.uk/Documents/Living/Planning/Policy/LDP/LDP-Adoption/Adopted-LDP-Proposals-Map.pdf

4.3 Local Authorities Well-being Objectives

In 2015 Welsh Government made a new law called the Well-being of Future Generations (Wales) Act. The new law has the sustainable development principle at its heart. This means that we need to work in a way that improves wellbeing for people today without doing anything that could make things worse for future generations.

As highlighted in the earlier **Figure 1.1**, there are seven national well-being goals that form the basis of the Act and five ways of working which support the goals.

Figure 1.1- The Well- being of Future Generations (Wales) Act 2015 Matrix



VOG adopts the principles of The Well-being of Future Generations (Wales) Act 2015. The Act is a significant enabler to improve air quality as it calls for sustainable cross-sector action based on the principles of long-term, prevention-focused integration, collaboration and involvement. It intends to improve economic, social, environmental and cultural well-being in Wales to ensure the needs of the present are met without compromising the ability of future generations to meet their own needs.

4.4 Climate Change Strategies

Featured in the adopted LDP, a main objective of the LDP is;

To ensure that development within the Vale of Glamorgan makes a positive contribution towards reducing the impact of and mitigating the adverse effects of climate change.

The LDP will seek to ensure that new development makes a positive contribution towards reducing the impact of and mitigating the adverse effects of climate change. New development will be located in sustainable locations that minimise the need to travel, incorporate sustainable design and building solutions. The Council's Renewable Energy Assessment (2016) has identified opportunities in the Vale of Glamorgan for a range of renewable energy schemes, particularly from standalone solar PV developments, small clusters of wind energy potential, biomass, and micro generation including Building Integrated Renewables [BIR]. Accordingly, to contribute towards meeting national renewable energy targets the Plan includes monitoring targets to meet 21.19% of projected electricity demand and 1.48% of projected heat demand in the Vale of Glamorgan through renewable sources by 2026. Therefore, the LDP will also promote energy conservation and local renewable energy generation. To mitigate the adverse effects of climate change new development will avoid areas susceptible to flooding.

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

5. Conclusions and Proposed Actions

5.1 Conclusions from New Monitoring Data

SRS on behalf of the VOG has examined the results from monitoring in the district. There were no exceedences of any pollutant objective in 2017, including monitoring locations within the declared AQMA. As discussed, continual compliance over a three year period with the national air quality objectives set for NO_2 (annual average 40µg/m^3 & 1-hour average 200µg/m^3 not be exceeded more than 18 times per year), has been demonstrated and in accordance with Local Air Quality Management in Wales, Policy Guidance, June 2017, the Vale of Glamorgan Council wish to revoke the Windsor Road, Penarth AQMA.

As required a supporting decision report will accompany this annual progress report which will highlight the continued compliance and will demonstrate compliance for future years for the defined AQMA area. The final decision to revoke the Windsor Road, Penarth AQMA will be decided by Welsh Government following a review and consultation with the local communities affected.

5.2 Conclusions relating to New Local Developments

Section 3.5 details a number of local developments which have either gained planning consent recently or for which a planning application has been received.

These applications have been handled accordingly where Air Quality Assessments have been produced and conditions applied accordingly.

5.3 Other Conclusions

There are no other conclusions to be drawn from the information provided herein.

5.4 Proposed Actions

The Annual Progress Report has identified that NO_2 and PM_{10} concentrations continue to satisfy national objectives. In line with best practise guidance it is acceptable to proceed to a revocation proposal for the Windsor Road, AQMA.

A detailed assessment using ADMS- Urban dispersion modelling software, will be utilised to verify existing compliant levels and project future levels for Windsor Road, using data from the existing monitoring sites. The report will outline the commitment of the VOG to ensure that there will be

a continued focus in the area to ensure air quality is still given a level of priority and considered carefully with any future developments that may arise.

The Specialist Services Team of SRS will work with VOG representatives from Highways & Transport and Planning Department and outline measures which have been undertaken, the effectiveness of these measures and future commitments/ initiatives that the Council may need to consider to be implemented in the area to ensure compliance is maintained and improved upon.

References

1. The Vale of Glamorgan Council Air Quality Progress Report, September 2017

2. Welsh Government, Local air quality management in Wales, Policy Guidance, June 2017

3. 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)

4. Vale of Glamorgan Planning Link
http://vog.planning-register.co.uk/plaDetails.aspx

5. UK National Air Quality Archive LAQM
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6. Vale of Glamorgan Local Development Plan 2011- 2026
http://www.valeofglamorgan.gov.uk/Documents/Living/Planning/Policy/LDP/LDP-Adoption/Adopted-LDP-Written-Statement-June-2017-final-interactive-web-version.pdf

7. Vale of Glamorgan The Local Transport Plan (2015- 2030)
http://www.valeofglamorgan.gov.uk/en/living/planning_and_building_control/planning_policy/local_transport_plan.aspx

8. Vale of Glamorgan Green Dragon
http://www.valeofglamorgan.gov.uk/en/living/environment/green_dragon/green_dragon.aspx

Appendices

Appendix A: Monthly Diffusion Tube Monitoring Results

Appendix B: A Summary of Local Air Quality Management

Appendix C: Air Quality Monitoring Data QA/QC

Appendix D: Supporting documentation

Appendix A: Monthly Diffusion Tube Monitoring Results

Table A.2 – Full Monthly Diffusion Tube Results for 2017

Site No	Nitrogen Dioxide Sites,VALECBC	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)	06/01/2016- 03/01/2017	03/01/2017 & 03/01/2017- 28/02/2017	28/02/2017- 28/03/2017	28/03/2017- 27/04/2017	27/04/2017- 30/05/2017	30/05/2017- 30/06/2017	30/06/2017- 03/08/2017	03/08/2017- 29/08/2017	29/08/2017- 29/09/2017	29/09/2017- 03/11/2017	03/11/2017- 07/12/2017	07/12/2018 - 03/01/2018	AVERAGE SINCE JAN 17	Bias Corrected (Correction Factor 0.77)	Distance corrected to Façade (if required)	Percentage of Data Capture
COWBRIDGE																							
54	High Street, Cowbridge	SS 299270 174737	Kerbside	1.00	5.00	4.00	7.32	47.10	35.30	23.80	23.70	21.00	24.20	17.30	14.20	23.70	18.10		29.7	25.3	19.5	15.5	100
65	1 Riverside Mews, Cowbridge	SS 299614 174592	Roadside	4.00	4.00	0.00	7.32	34.00	22.10	22.10	19.90	14.40	16.60	13.10	12.00	18.40	15.90	25.10	23.4	19.8	15.2	15.2	100
101	37 Westgate House	SS 298903 174907	Kerbside	0.75	0.75	0.00	6.19	35.10	29.60	27.30	26.30	16.00	21.80	20.70	18.40	26.20	21.60	35.80	31.3	25.8	19.9	19.9	100
LLANTWIT MAJOR																							
93	Le Pouliguen Way	SS 297171 168741	Roadside	4.80	4.80	0.00	6.13	26.40		16.00	14.40	14.90	10.40	8.80	8.90	12.00	12.00	20.20	17	14.6	11.3	11.3	92
94	5 Boverton Road	SS 297069 168715	Roadside	7.40	7.40	0.00	6.13	25.00	10.90	13.00	13.90	10.40	9.10	8.60	6.50	10.30	9.00	14.80	13.6	12.1	9.3	9.3	100
95	Millands Caravan Park	SS 298861 169236	Rural	290.00	290.00	0.00	6.30	18.80	15.70	9.60	10.40	6.90	6.20	4.70	4.30	6.20	6.10	10.20	8.9	9.0	6.9	6.9	100
96	Old Froglands Farm	SS 299045 169126	Suburban	86.00	86.00	0.00	5.30	26.20	17.90	14.50	11.20	11.30	5.70	5.00	4.80		8.70	13.60	14.8	12.2	9.4	9.4	92
St. ATHAN																							
97	7 Picketson Close	SS 300460 169310	Urban Background	30.00	30.00	0.00	5.61	25.70	12.6	10.5	9.4	9.4	6.1	12.9	4.7	7.5	7.8	12.3	12.3	10.9	8.4	8.4	100
GILESTON																							
98	Orchard Way (Ivy Cottage)	SS 301899 167043	Suburban/ Industrial	450.00	450.00	0.00	6.13	18.40	11.5	9	8.1	7.7	5.8	5.6	3.8	6.2	5.9	9.2	9.4	8.4	6.5	6.5	100
RHOOSE																							
99	Fonmon Road Lampost	SS 304894 166898	Kerbside	0.90	8.90	8.00	7.38	26.80	20.5		11.4	8.6	8.3					15.8	12.6	14.9	11.4	9.6	58
SAINT BRIDES MAJOR																							
103	September Cottage	SS 289530 174896	Roadside	6.50	6.50	0.00	5.57		20.2	14.3	15.3	12.4	10.1	9	8.4	10.1	10.7	17.2	15.1	13.0	10.0	10.0	92
104	Greengate Cottage	SS 289496 174858	Roadside	12.50	12.50	0.00	5.57		17.5	15.4	16.3	14.6	10.7	9.8	8.9	13.1	11.1	17.8	14.9	13.6	10.5	10.5	92
105	St. Brides Primary School Walkway Entrance	SS 289473 174752	Kerbside	0.95	9.00	8.05	5.57		17.7	20.7	18.3	13	11.3	10.5	15.9	13.7	14.1	21.3	19.6	16.0	12.3	9.3	92
106	Dany Bryn House	SS 289454 174668	Roadside	2.10	2.10	0.00	5.57		17.3	13.9	14.4	11.4	7.5	8	8.6	11.4	10	17.5	14.3	12.2	9.4	9.4	92
107	Hilboro	SS 289512 174805	Roadside	7.50	7.50	0.00	5.57		13.4	10.7	11.9	8	5.9	6.2	5.7	8.3	7.6	14.9	12.3	9.5	7.3	7.3	92
CULVERHOUSE																							
38	2 Horseshoes	SS 311892 174513	Roadside	2.00	2.00	0.0	13.07		25.30	26.60	29.70	15.70	24.10	22.00	22.80	26.80	23.50	33.5	29.30	25.4	19.6	19.6	92
DINAS POWYS																							
7	Cardiff Road/Millbrook	SS 315773 171514	Roadside	2.00	20.00	18.0	11.64	50.10	36.60	37.00	28.40	26.60	30.30	23.40	21.20	27.50	23.60	33.40	27.30	30.5	23.4	18.5	100
46	46 Cardiff Road	SS 315747 171369	Roadside	5.00	5.00	0.0	11.64	37.70	29.70	23.50	20.30	20.40	20.40	15.10	14.20	20.00	18.00	26.70	20.40	22.2	17.1	17.1	100
47	Dinas Powys Health Centre	SS 315710 171385	Urban Background	16.00	20.00	4.0	11.64		22.00	17.20	12.70	10.10	11.60	8.10	7.70	11.50		16.00	14.70	13.2	10.1	11.6	83
61	Railway Terrace	SS 316433 171932	Roadside	2.00	2.00	0.0	11.86	53.80	46.30	41.10	40.50	34.00	40.60	30.40	30.40	36.80	33.80	45.20	40.40	39.4	30.4	30.4	100
67	2 Matthew Terrace	SS 316488 172004	Roadside	2.50	2.50	0.0	13.00	40.00	35.20	33.60	32.20	26.30	29.50	23.00	19.90	17.70	20.90	30.00	25.10	27.8	21.4	21.4	100
72a	Dinas Powys Infants School	SS 315841 171527	Roadside	7.00	7.00	0.0	11.64	41.70	29.60	32.60	22.70	21.20	25.10	18.50	17.50	26.20	20.80	32.60	20.90	25.8	19.9	19.9	100
89	9 Wayside Cottages, Cardiff Road	SS 316447 171963	Roadside	3.00	3.00	0.0	11.86	45.90	41.40	38.70	40.10	25.70	42.00	30.00	28.30	34.90	31.40	46.00	36.70	36.8	28.3	28.3	100
90	16 Railway Terrace, Cardiff Road	SS 316453 171945	Roadside	3.00	3.00	0.0	11.86	40.10	36.50	28.30	25.80	23.40	25.20	19.80	21.00	14.90	22.10	28.7	21.80	25.6	19.7	19.7	100
LLANDOUGH																							
68	Glen View , 99 Penlan Road	SS 316886 172561	Roadside	9.00	9.00	0.00	13.00	33.60	20.80	22.70	19.30	14.10	18.60	13.40	12.20	20.10	16.50	23.30	20.10	19.6	15.1	15.1	100
69	65 Penlan Road	SS 316847 172948	Roadside	7.50	7.50	0.00	13.00	27.90	23.90	20.30	20.60		34.90	12.40		17.10	16.20	24.10	17.90	21.5	16.6	16.6	92
PENARTH																							
22	Stanwell Road	SS 318505 171496	Roadside	1.00	9.00	8.0	13.65	38.70	31.80	29.40	30.90	19.80	26.30	18.40	22.10	27.30	22.20	39.20	34.20	28.4	21.8	18.2	100
29	Cogan Roundabout	SS 317406 172796	Roadside	3.00	3.00	0.0	14.40	52.90	41.00	48.60	37.00	29.90	37.60	35.00	37.80	44.50	35.20	49.40	40.20	40.8	31.4	31.4	100
53	168 Windsor Road	SS 317589 172411	Roadside	5.00	5.00	0.0	14.40	49.30	39.40	42.20	45.50	32.60	40.20	24.10	34.00	39.30	33.10	39.80	44.20	38.6	29.8	29.8	100
55	159 Windsor Road	SS 317595 172435	Roadside	2.00	2.00	0.0	14.40	45.40	38.30	39.20	38.50	30.20	36.70	27.60	24.70	32.90		34.90	27.40	34.2	26.3	26.3	92
56	134 Andrew Road	SS 316814 172443	Roadside	10.00	10.00	0.0	14.40	35.00	34.40	29.40	28.00	29.80	27.50	21.00	24.30	29.20	26.80	47.9	28.9	30.2	23.2	23.2	100
62	154 Windsor Road	SS 317633 172357	Roadside	2.00	2.00	0.0	14.40	50.50	45.10	47.10	46.30	34.10	40.60	35.90	32.30	31.00	32.20	49	42.70	40.6	31.2	31.2	100
70	Ty-Isaf	SS 316731 172391	Roadside	2.00	3.00	1.0	13.00	46.20	33.10	31.70	31.30	23.30	24.10	16.60	16.70	21.20		32.4	25.30	27.4	21.1	20.3	92
73a	Windsor Road Monitor 1	SS 317598 172399	Roadside	2.00	4.00	2.0	14.40	60.90	42.50	42.90	42.50	30.20	41.30	33.50	31.80	40.70	30.90	49.3	36.60	40.3	31.0	31.0	100
73b	Windsor Road Monitor 2	SS 317598 172399	Roadside	2.00	4.00	2.0	14.40	47.10	38.90	43.20	41.50	35.80	47.50	32.90	30.60	43.00	28.70	43.9	43.90	39.8	30.6	30.6	100
73c	Windsor Road Monitor 3	SS 317598 172399	Roadside	2.00	4.00	2.0	14.40	50.40	34.30	43.20	41.30	32.50	46.00	32.60	31.90	43.60	31.60	47.4	40.30	39.6	30.5	30.5	100
74	114 Windsor Road	SS 317708 172259	Roadside	2.50	2.50	0.0	14.40	48.10	41.60	39.00	38.90	27.20	31.70	29.00			25.40	45.3	42.90	36.9	28.4	28.4	83
76	160 Windsor Road	SS 317627 172371	Roadside	2.50	2.50	0.0	14.40	48.30	42.40	44.30	44.50	31.30	38.70	30.90	32.80	42.20	32.40	48.3	41.70	39.8	30.7	30.7	100
100	141 Plassey Street	SS 317968 172105	Roadside	4.50	4.50	0.0	14.40	43.00	32.60	28.20	35.30	28.60	31.50	25.50	16.20	29.50	27.10	43	31.6	31.0	23.9	23.9	100
79	Marine Scene	SS 317549 172572	Roadside	1.20	4.00	2.8	14.40	55.30	50.30	56.60	50.10	47.30	52.00	40.90	41.80	53.20	40.60	58.4		49.7	38.3	32.3	92
80	113 Plassey Street	SS 318150 172043	Roadside	5.40	5.40	0.0		30.20		20.70	16.90									22.6	17.4	17.4	NR
82	98b Windsor Road	SS 318061 171944	Roadside	8.00	8.00	0.0		40.90	29.30	23.40	21.60	15.60	16.60	13.10	14.00	21.70	16.60	27.3	23.20	21.9	16.9	16.9	100
88	134 Windsor Road	SS 317668 172312	Roadside	3.50	3.50	0.0	14.40	51.80	44.80	44.50	41.80	19.80	38.90	32.70	28.70	41.10	33.20	47.9	39.90	38.8	29.8	29.8	100
BARRY																							
8	Tynewydd Road	SS 311797 168503	Kerbside	1.00	5.00	4	11.51	59.30	48.60	45.60	41.40		39.00	31.00	30.10	36.50			41.8	41.5	31.9	25.3	75
41	Despenser Road	SS 315278 168451	Urban Background	128.00	128.00	0		27.90	22.60	22.40	10.80	7.90	13.00	9.70	9.10	9.10	9.80	18.3	18.8	15.0	11.5	11.5	100
64	Holton Road	SS 311690 168042	Roadside	3.00	3.00	0			35.70	28.80	20.50	16.80	23.40	14.00			18.20	24.1	23.3	22.8	17.5	17.5	75
66	17 Churchill Terrace	SS 313342 168823	Roadside	1.50	6.00	4.5	10.26	47.80	47.20	46.60	43.30	25.50	35.70	26.90	31.00	38.60	33.80	50	48.10	39.5	30.4	24.3	100
71	76 High Street (O'Donovans)	SS 310764 167505	Roadside	2.00	2.00	0		31.40	31.50	28.00	20.50	16.20	19.00	14.00		16.60	15.70	22.8	22.80	21.7	16.7	16.7	92
83	24 Cardiff Road	SS 315997 168829	Roadside	2.50	2.50	0			44.30	43.50				20.90			29.40		41.80	36.0	27.7	27.7	42
102	Powell Dyfryn Way	SS 311115 167041	Kerbside	1.00	4.40	3.4	11.27	39.20		32.00					15.30		20.50	28.4	27.90	27.2	21.0	18.1	50

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

Appendix B: A Summary of Local Air Quality Management

Purpose of an Annual Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in the Environment Act 1995 and associated government guidance. 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 being achieved. Where exceedances occur, or are likely to occur, the local authority must then declare an Air Quality Management Area (AQMA) and prepare a **DRAFT** Air Quality Action Plan (AQAP) within 18 months, setting out measures it intends to put in place to improve air quality in pursuit of the air quality objectives. The AQAP must be **formally** adopted prior to 24 months has elapsed. Action plans should then be reviewed and updated where necessary at least every 5 years.

For Local Authorities in Wales, an Annual Progress Report replaces all other formal reporting requirements and have a very clear purpose of updating the general public on air quality, including what ongoing actions are being taken locally to improve it if necessary.

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 B.2.

The table shows the objectives in units of microgrammes per cubic metre µg/m3 (milligrammes per cubic metre, mg/m3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table B.2 – 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	
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40µg/m^3	Annual mean	31.12.2005
Particulate Matter (PM_{10})	50µg/m^3, not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	18µg/m^3	Annual mean	31.12.2010
Particulate Matter ($PM_{2.5}$)	10µg/m^3	Annual mean	31.12.2020
Sulphur dioxide (SO_2)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	3.25µg/m^3	Running annual mean	31.12.2010
1,3 Butadiene	2.25µg/m^3	Running annual mean	31.12.2003
Carbon Monoxide	10.0mg/m^3	Running 8-Hour mean	31.12.2003
Lead	0.25µg/m^3	Annual Mean	31.12.2008

Appendix C: Air Quality Monitoring Data QA/QC

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 06/18) was used to obtain an overall adjustment factor of 0.77 from the input data shown in the following screen shot. This overall factor is based on 29 co-location studies where the tube preparation method and analysis laboratory used were the same as those used by VOG.

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

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 06/18

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies
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.

This spreadsheet will be updated at the end of September 2018
LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List — If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List — If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List — If a year is not shown, we have no data[2]

Step 4: 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[3] shown in blue at the foot of the final column.

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

Analysed By[1]	Method (To view your co-location, choose (All) from the pop-up list)	Year[2] (To view your co-location, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[4]	Bias Adjustment Factor (A) (Cm/Dm)
ESG Didcot	50% TEA in acetone	2017	R	Tunbridge Wells	12	56	40	38.2%	G	**0.72**
ESG Didcot	50% TEA in acetone	2017	UB	Kingston upon Hull City Council	12	32	23	38.2%	G	**0.72**
ESG Didcot	50% TEA in acetone	2017	UB	Kingston upon Hull City Council	12	32	23	38.2%	G	**0.72**
ESG Didcot	50% TEA in acetone	2017	R	Suffolk Coastal DC	12	45	37	23.8%	G	**0.81**
ESG Didcot	50% TEA in acetone	2017	R	Dacorum Borough Council	9	31	27	14.7%	G	**0.87**
ESG Didcot	50% TEA in acetone	2017	R	North East Lincolnshire Council	11	37	24	53.5%	G	**0.65**
ESG Didcot	50% TEA in acetone	2017	UB	Swansea Council	10	17	14	23.4%	G	**0.81**
ESG Didcot	50% TEA in acetone	2017	R	Swansea Council	12	33	24	34.5%	G	**0.74**
ESG Didcot	50% TEA in acetone	2017		**Overall Factor[3] (29 studies)**				Use		**0.77**

Discussion of Choice of Factor to use

The bias adjustment factor applied to all 2017 data is 0.77. The applied bias adjustment factor has been calculated using the national diffusion tube bias adjustment factor spreadsheet version 06/18. The individual bias adjustment factor calculated using the Penarth, Windsor Road automatic monitoring system and the co-located triplicate diffusion tubes has not been adopted as the bias adjustment factor derived from the study was slightly less than the figure generated by the national, 0.66 compared to 0.77. Therefore it was deemed good practise to use the nationally derived bias adjustment factor as this would reflect a “worst-case scenario”.

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

Diffusion Tubes Adjustment

The Nitrogen Dioxide (NO_2) obtained via the use of passive diffusion tubes during January to December 2017 were annualised via the method described in Box 7.10 of LAQM TG(16). 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 C.1– Long term AURN site used for calculation of nitrogen dioxide annualisation ratio for Diffusion Tube 83

Site	Site Type	Annual Mean (µg/m^3)	Period Mean (µg/m^3)	Ratio
Cwmbran AURN	Urban Background	12.09	12.29	0.98
Bristol St Paul's AURN	Urban Background	23.58	23.50	1.00
Average Ratio				0.99

Table C.2 – Long term AURN site used for calculation of nitrogen dioxide annualisation ratio for Diffusion Tube 99

Site	Site Type	Annual Mean (µg/m^3)	Period Mean (µg/m^3)	Ratio
Cwmbran AURN	Urban Background	12.09	14.04	0.86
Bristol St Paul's AURN	Urban Background	23.58	26.57	0.89
Average Ratio				0.87

Table C.3 – Long term AURN site used for calculation of nitrogen dioxide annualisation ratio for Diffusion Tube 102

Site	Site Type	Annual Mean (µg/m^3)	Period Mean (µg/m^3)	Ratio
Cwmbran AURN	Urban Background	12.09	14.78	0.82
Bristol St Paul's AURN	Urban Background	23.58	28.09	0.84
Average Ratio				0.83

QA/QC of Diffusion Tube Monitoring

The diffusion tubes are supplied and analysed by Environmental Scientifics Group Didcot, using the 50% triethanolamine (TEA) in water method. Environmental Scientifics Group Didcot 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 Environmental Scientifics Group 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 laboratory Environmental Scientifics Group Didcot is regarded ranked as the highest rank of satisfactory in relation to the WASP intercomparison scheme for spiked Nitrogen Dioxide diffusion tubes. 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

Appendix D: Supporting documentation

Docks Office, Barry Biomass Boiler Emissions Certification

ofgem e-serve

Renewable Heat Incentive

Non-domestic Renewable Heat Incentive Emissions Certificate

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.

1. TEST HOUSE	
a) name and address of testing laboratory	TÜV SÜD Industrie Service GmbH Abteilung Feuerungs- und Wärmetechnik Ridlerstrasse 65 80339 München Germany
b) name and signature of the person authorised by the testing laboratory to issue the certificate	Johannes Steiglechner
c) date of issue of the certificate together with certificate reference number	2013-10-25, 13 09 91257 014
d) if testing laboratory is accredited to ISO 17025, date of accreditation and accreditation number *(note: if testing conducted after 24 September 2013, the testing laboratory must be ISO 17025 accredited)*	initial date of accreditation 1992-08-10, accreditation number: ZLS-L-023/92, actual accreditation by DAkkS (www.dakks.de), date 2013-04-29, DAkkS accreditation number: D-PL-14153-04-00

1 of 3

Certificate reference number: 13 09 91257 014

Version 1.0: Issued August 2013

2. PLANT	
a) name of the plant tested	BioWIN XL ... Exklusiv
b) model of the plant tested	BioWIN XL 600 Exklusiv also traded as BWE 600
c) manufacturer of the plant tested	Windhager Zentralheizung Technik GmbH Anton-Windhager-Strasse 20 5201 Seekirchen Austria
d) installation capacity of the plant in kilowatts (kW)	18,0 kW– 60,0 kW
e) is the plant a manually stoked, natural draught plant? (that is, without a fan providing forced or induced draught)	no
f) the date the plant was tested	2010-11-09 (nominal power) 2010-11-10 (partial power)
g) list of all the plants in the type-testing range of plants to which the certificate applies, if any[1]	BioWIN XL 450 Exklusiv (13,5 kW-45,0 kW) also traded as BWE 450

3. FUELS	
a) types of fuels used when testing	compressed wood, C1 (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) *(based if relevant on classifications from EN14961 or EN303-5)*	compressed wood, C1 (EN 303-5)
c) moisture content of the fuel used during testing	w: 7,5 %
d) maximum moisture content of the fuel which can be used so as to ensure that the emission limits are not exceeded	w: 12 %, C1 (EN 303-5)

[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	
a) **if the plant is 500kW or lower, and BS EN 303-5:1999 or EN 303-5:2012[2] applies to it,** please confirm: - tests were conducted to whichever standard was current at the time of testing. *(please circle the applicable standard)*	EN 303-5:1999
b) **if the plant is 500kW 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 500kW 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 no, but according to CEN/TS 15883:2009, appendix A, see also EN 303-5:2012, clause 5.2, PM measurement
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
g) measured emissions of PM in g/GJ net heat input	8 (nominal power) 8 (partial power)
h) measured emissions of NOx in g/GJ net heat input	78 (nominal power) 67 (partial power)

[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.

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Certificate reference number: 13 09 91257 014

Version 1.0: Issued August 2013

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
VOG	Vale of Glamorgan Council