Bridgend 2022 Air Quality Progress Report

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

Date: June 2022

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Executive Summary: Air Quality in Our Area

What has become distinctly apparent is that air Pollution is a local and national problem. Long-term exposure reduces life expectancy by increasing mortality, as well as increasing morbidity risks from heart disease and strokes, respiratory diseases, lung cancer and other effects.

What we know is that poor air quality in Wales poses a significant concern for Public Health and is regarded as the most significant environmental determinant of health. Its associated adverse risk to public health is particularly prevalent within urban areas and near major roads. The pollutants of primary concern for public health are particulate matter and primary/ secondary derived nitrogen dioxide (NO_2). Both pollutants primarily originate from motor vehicles.

The UK expert Committee on the Medical Effects of Air Pollution (COMEAP) estimates that air pollution is responsible for "an effect equivalent of between 28,000 and 36,000 deaths (at typical ages) each year"[1]. This does not mean there are 'actual' deaths from air pollution exposure; rather, that the reduced life expectancy which everyone experiences because of air pollution exposure (6-8 months on average but could range from days to years) is 'equivalent' to between 28,000 and 36,000 deaths when summed. In Wales, based on the latest data available (for 2017)[2], Public Health Wales estimates the burden of long-term air pollution exposure to be the equivalent of 1,000 to 1,400 deaths (at typical ages) each year.

Despite the efforts made by national government and local authorities there is an apparent disconnect between air quality management and Public Health. The status of Air Quality management in Wales focuses upon a hotspot approach and fails to reference other factors such as socioeconomic status or exposure to other environmental determinants of health.

Fundamentally, it is plausible that air pollution affects everyone to some extent. Whilst the legislative air quality limit values are based on epidemiological evidence and are ultimately intended to protect public health, there is also recognition that health effects may be experienced below these thresholds for some of the key pollutants (e.g., $PM_{2.5}$ and NO_2), particularly affecting the most

[1] COMEAP (2018). Associations of long-term average concentrations of nitrogen dioxide with mortality. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/734799/COMEAP_NO2_Report.pdf

[2] Welsh Government StatsWales. https://statswales.gov.wales/Catalogue/Environment-and-Countryside/Air-Quality/airqualityindicators

susceptible groups: young children, the elderly and those with pre-existing health conditions and comorbidities. Acknowledged as the triple jeopardy concept- air pollution combines with other aspects of the social and physical environment to create an inequitable disease burden on more deprived parts of society; populations of areas with low socioeconomic status are prone to exacerbated effects from exposure to air pollution. In part this is because they are more likely to suffer pre-existing health conditions because of their poorer living conditions and lifestyle, and also as they are more vulnerable, being more likely to be living in areas with higher levels of air pollution.

The COVID-19 pandemic has impacted air quality at local, regional, and national scales and presented challenges to Local Authorities in undertaking statutory LAQM duties.

As stated in the Bridgend 2021 APR[3], in 2020 an average reduction of 22% in NO_2 annual mean concentration was experienced at roadside diffusion tube monitoring sites across the County Borough relative to 2019. Although still exceeding the NO_2 annual objective of 40 µg/m^3, sites OBC-010 and OBC-123 in the Park Street AQMA, saw a reduction in NO_2 annual mean concentration of 21.2% and 24.1% respectively, relative to 2019.

Analysis was undertaken by air quality consultants Ricardo, on behalf of Welsh Government[4], to assess the impact of lockdown on air quality during the period of the 16th of March 2020 to 31st of May 2020. This analysis showed decreased concentrations in nitrogen oxides during this period due to reduced emissions with less traffic on our roads.

Analysis of a limited sample of traffic data shows a significant drop in vehicle flows at the time of the lockdown, mostly in the Car/Light Van and Bus categories as expected. The fall-off in vehicle counts for the heavier goods vehicles is less significant.

Air Quality in Bridgend

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. Under

3 https://www.srs.wales/Documents/Air-Quality/Bridgend/Bridgend-APR-2021.pdf

4 https://airquality.gov.wales/sites/default/files/documents/2020-08/Analysis_of_Welsh_Air_Quality_Data_Impacts_of_Covid-19_Final_Issue2.pdf

Section 82 of the Environment Act 1995 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 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 Local Authorities' statutory duties under Part IV of the Environment Act 1995, in 2021 Shared Regulatory Services (SRS) on behalf of BCBC undertook regular air quality monitoring at specifically allocated locations across Bridgend using automated and non-automated principles for ambient air nitrogen dioxide (NO_2), particulate matter (PM_{10}) & sulphur dioxide (SO_2).

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 (LAQM) Technical Guidance 16 (TG16), April 2021. The designated monitoring locations are assigned based on relevant exposure and where the certain Air Quality Objective levels for a particular pollutant applies. TG16 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, care homes etc."

Bridgend Council's 2018 APR documented and made the recommendation to implement and raise an Order for an Air Quality Management Area (AQMA), designated to Park Street, Bridgend. On 18th September 2018 BCBC's Cabinet approved the 2018 LAQM APR 2018 for Bridgend. The report examined datasets captured during 2017 and noted that Park Street, Bridgend was an area of particular concern and subsequently an Air Quality Management Area (AQMA) was required. It was reported that two nitrogen dioxide (NO_2) non-automated monitoring locations situated at residential facades on Park Street, as detailed in Table 1 & Figure 1 recorded elevated and exceeding annual average levels of NO_2 when compared to the annual mean NO_2 Air Quality Objective of 40 $\mu g/m^3$.

Table 1 - 2017 Park Street Exceedances

Site ID	Annual Mean Concentration ($\mu g/m^3$) AQS = 40 $\mu g/m^3$ (2) 2017
OBC- 102	23.7
OBC- 103	37.6
OBC- 104	**41.5**

Notes: Exceedances of the NO_2 annual mean objective of 40 $\mu g/m^3$ are shown in bold.

NO_2 annual means exceeding 60$\mu g/m^3$, 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 1 – 2017 Park Street NO_2 Monitoring Locations

Based on the 2017 NO_2 datasets, in accordance with Welsh Government's (WG) Policy Guidance and Section 83 of the Environment Act 1995, SRS/ BCBC was required to legally declare an Air Quality Management Area (AQMA) for Park Street, and in doing so raise an AQMA order that defines the detail and locality of the AQMA.

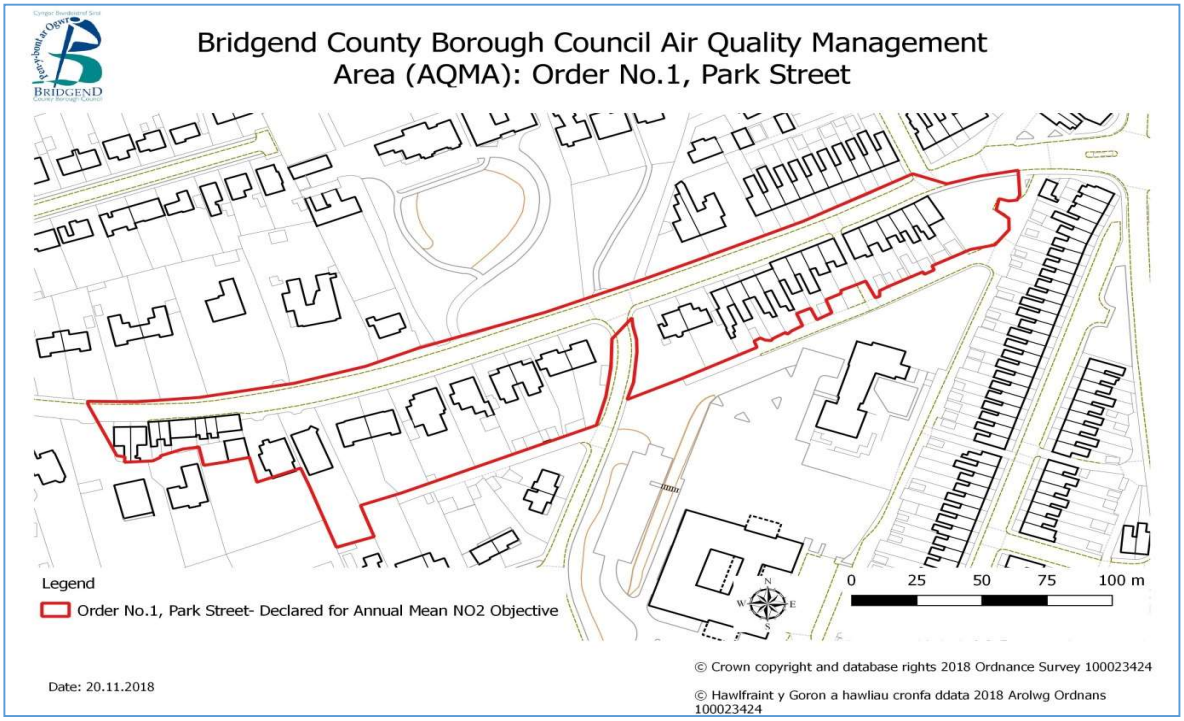
Park Street, Bridgend AQMA

There has been a delay in publishing the Air Quality Action Plan (AQAP) since it's declaration in 2019. This delay was caused by the COVID-19 pandemic and associated restrictions. This prevented traffic consultants from gathering accurate data for traffic outputs required to produce the air quality modelling detailed assessment. At the time of writing this report, the draft AQAP has been completed and is due for public consultation in the summer of 2022. A final AQAP will be submitted to Welsh Government later this year once the results of the public consultation have been duly considered.

The Park Street, Bridgend AQMA Order was officially implemented on the 1st of January 2019. The area comprising the Bridgend County Borough Council Air Quality Management Area Order No. 1, Park Street is that contained within the following boundary.

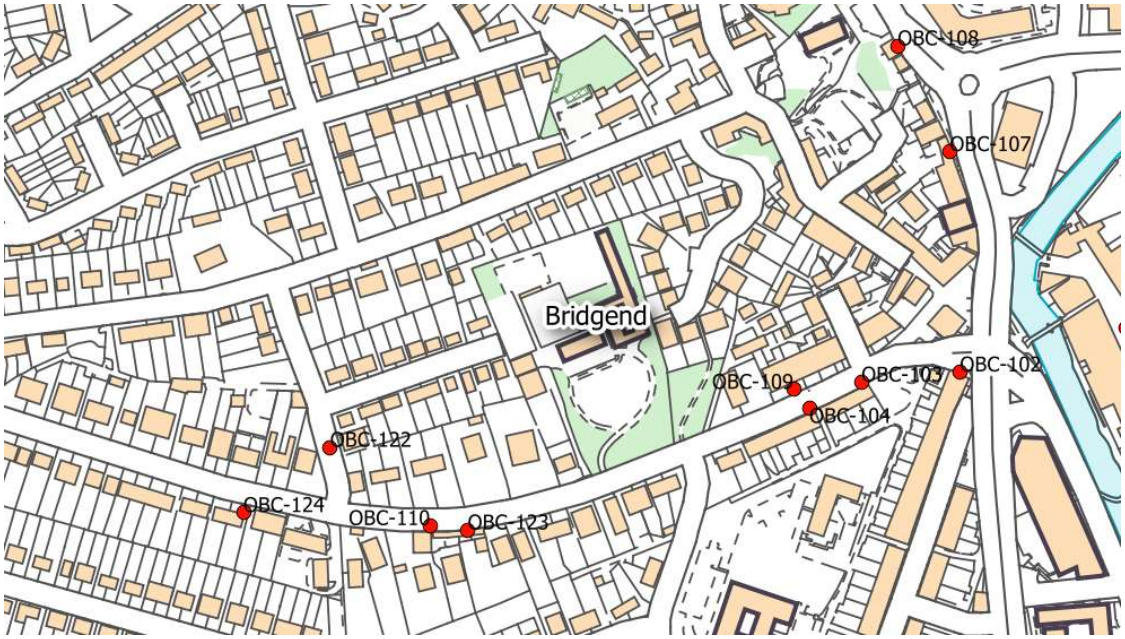
The designated area borders the green space area prior to the rear entrance of properties located on Sunnyside Road. The designated area incorporates all north facing properties, including their open space areas between 39 Park Street and 105 Park Street. The boundaries' northern side borders the open space areas that front the south facing properties encapsulating the public access pathway.

Figure 2 – Map of Park Street AQMA



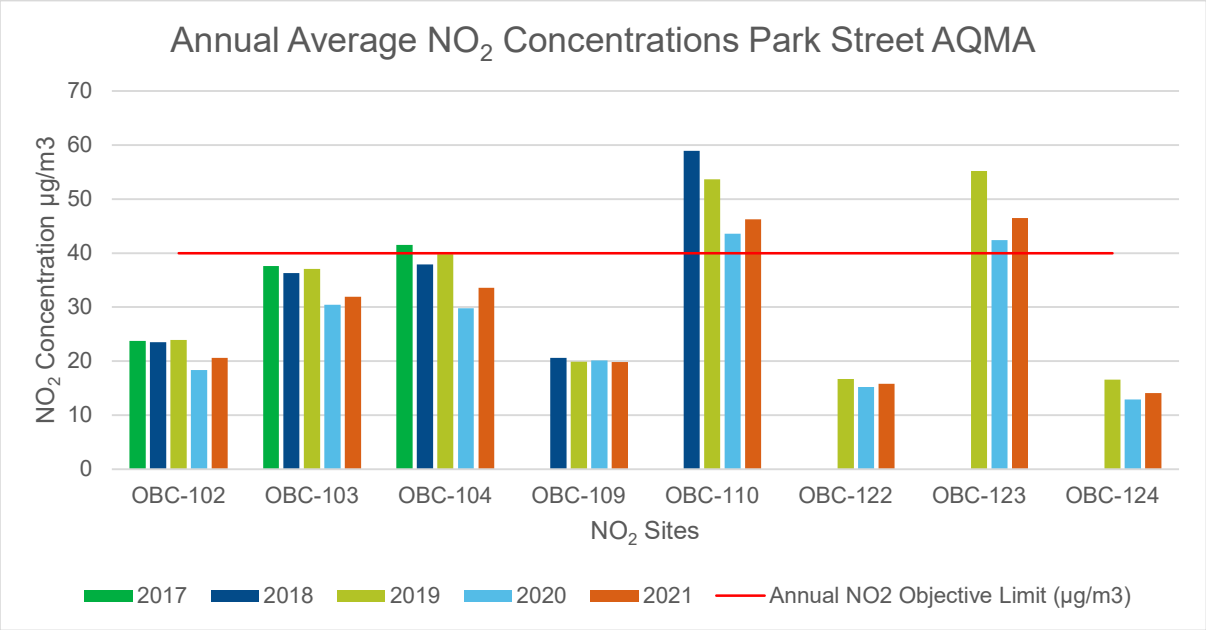
Since 2017, monitoring for NO_2 was further increased along Park Street and adjoining road networks. Figure 3 illustrates the network of monitoring for Park Street & Tondu Road.

Figure 3 - Park Street AQMA NO2 Monitoring Locations Since 2019



This Annual Progress Report confirms that in 2021 air quality was a prevalent concern along Park Street and coincides with the geographical boundary of the Park Street, Bridgend AQMA Order raised on the 1st January 2019.

Figure 4 - Park Street AQMA Annual Mean NO2 Monitoring Results 2017 – 2021



In **Figure 4** It is noted that in 2021, monitoring undertaken at sites **OBC-110 & OBC-123**, located on Park Street residential facades, exceeds the annual average air quality objective set at (40 µg/m^3) for NO_2.

Despite the referenced sites of concern, all other monitoring locations across Bridgend demonstrate compliance with the applicable air quality objectives.

With particular focus on nitrogen dioxide (NO_2), in December 2020 BCBC introduced an automated air quality monitoring system within the Park Street AQMA. The equipment allows air quality trends to be examined on a high temporal resolution basis and therefore be able to assist with underpinning those short-term periods whereby raised levels of NO_2 and PM_{10} are particularly prevalent. This data will be particularly useful in assigning traffic control measures for certain time periods.

SRS/ BCBC examined potential locations along Park Street, within the AQMA boundary to implement the automated air quality monitoring equipment. Following preliminary site visits with air quality monitoring equipment suppliers and Bridgend's Highways Team, it was evident that Park Street posed as a rather difficult area to implement an air quality monitor due to narrow foot ways and

the fact that Park Street is designated as traffic sensitive, only allowing highway works between restricted hours.

To overcome these concerns, it was noted that the Quaker's Meeting House (Bridgend Quaker Meeting, 87 Park St, Bridgend, CF31 4AZ) car park offered a preferable location and would be a representative location for data collection.

SRS & BCBC recognises that to tackle known pockets of poor air quality, a more suitable and constructive approach is required to target the whole of Bridgend, improving overall air quality. With the implementation of correct long-term measures, highlighted road networks and identified areas of concern, Bridgend should be able to benefit from improved air quality.

Welsh Government's guidance on local air quality management recommended two clear goals:

(1) achieve compliance with the national air quality objectives in specific hotspots and

(2) reduce exposure to pollution more widely, to achieve the greatest public health benefit.

Collective efforts, therefore, should look beyond targeted action in localised air pollution hotspots and do this in parallel with universal action to reduce risks for everyone.

As stated by WG's policy guidance the following ways of working should be incorporated when devising any AQAP:

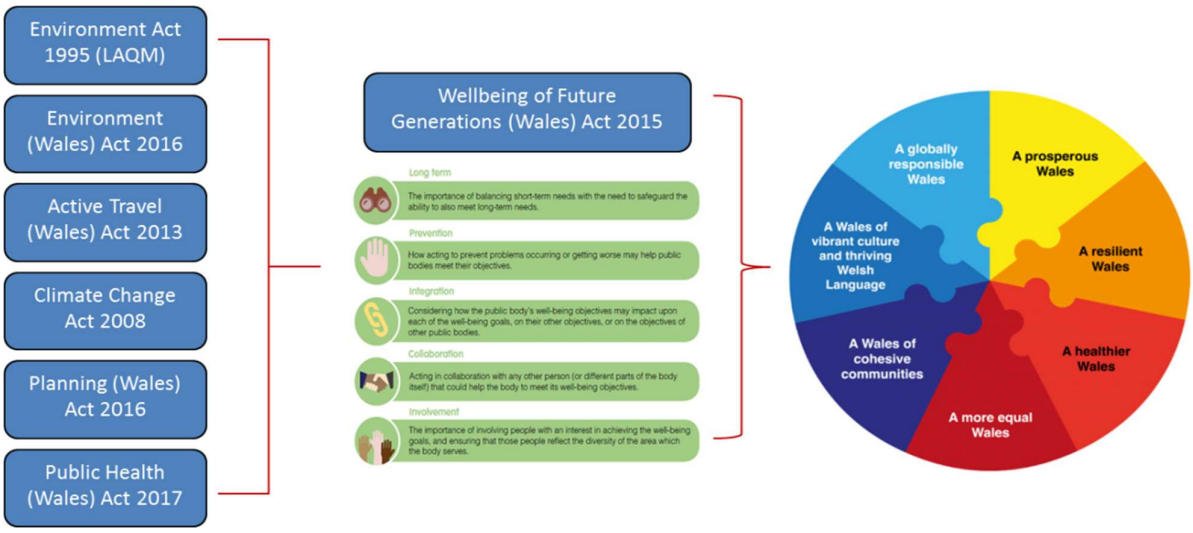
- Looking to the **long term** so we do not compromise the ability of future.
- Generations to meet their own needs.
- Taking an **integrated** approach.
- **Involving** a diversity of the population in the decisions affecting them.
- Working with others in a **collaborative** way to find shared sustainable solutions.
- Acting to **prevent** problems from occurring or getting worse.

In sight of these aspirations SRS & BCBC 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 5 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 Bridgend (and wider).

Figure 5 - The Well-being of Future Generations (Wales) Act 2015 Matrix



Welsh Government, Clean Air Plan for Wales, Healthy Air Healthy Wales

At the time of drafting this report WG has published its latest plan which underpins its commitment and long-term ambition to improve air quality in Wales. The plan sets out WG's policy direction and proposed actions to reduce air pollution to support improvement in public health and the natural environment. Actions are proposed across four thematic themes, examined as People, Environment, Prosperity, and Place.

The plan and its proposed actions are available at:
https://gov.wales/sites/default/files/publications/2020-08/clean-air-plan-for-wales-healthy-air-healthy-wales.pdf

SRS/ BCBC support the aspirations of the plan and welcome the development of more stringent mitigation measures that will enable a cohesive approach to air quality management and protecting public health and the natural environment.

Actions to Improve Air Quality

To improve its monitoring capabilities, for 2021 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 to increase the network's geographical footprint.

An automatic air monitoring station was installed within the Park Street AQMA. This monitoring station measures concentrations of nitrogen dioxide (NO_2) and particulate matter (PM_{10}). This monitoring station is part of the Welsh Automatic Urban Pollution Monitoring Network. Details of for this monitoring station can be found at https://airquality.gov.wales/

Local Priorities and Challenges

For air quality work within Bridgend, the Park Street Air Quality Action Plan (AQAP) is being prioritised. As discussed previously, due to the COVID-19 pandemic there have been delays in achieving statutory timescales for completion of this document. We are keen to hear opinions on this issue from members of the public through the consultation period, and we hope a list of measures for the AQAP can be agreed on. Air quality monitoring within and around the Park Street AQMA will continue and be prioritised during this time.

How to Get Involved

BCBC welcomes any correspondence relating to air quality enquiries or concerns. Shared Regulatory Services (SRS) Specialist Services Team represents BCBC for air quality and therefore is contactable via the webpage www.srs.wales/en/Home.aspx OR via their direct team email AirQuality-SRSWales@valeofglamorgan.gov.uk.

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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, Bridgend County Borough Council published reports corresponding to stages 1, 2 and 3 of the first round of review and assessment of air quality. Seven key pollutants were examined (carbon monoxide, benzene, 1,3-butadiene, lead, nitrogen dioxide, fine particles (PM_{10}) and sulphur dioxide). These assessments predicted no exceedances of any of the objectives. It concluded that to fulfil the requirements of the Environment Act 1995, air quality should be reviewed and assessed again in 2003.

Second Round of Review and Assessment

Following new technical and policy guidance issued by Defra, Bridgend County Borough Council published its first Updating and Screening Assessment (USA) in June 2003. Of the seven pollutants subjected to the updating and screening assessment process, it was concluded that the likelihood of the air quality objectives for carbon monoxide, benzene, 1,3-butadiene, lead, and sulphur dioxide being exceeded was negligible and that it was not necessary to carry out a detailed assessment of any of these pollutants. However, the updating and screening assessment for nitrogen dioxide and PM_{10} revealed gaps in the data gathered and concluded that there was evidence to suggest non-compliance with the air quality objectives for PM_{10} and NO_2 at three locations resulting from road traffic emissions. It was suggested that there was a requirement to continue to a Detailed Assessment for the following locations:

- A48 Ewenny Cross, Bridgend
- The western end of Cowbridge Road, Bridgend
- The western end of the Bridgend Cross Valley Link Road.

In addition, it was also recommended to carry out a co-location exercise to determine the bias correction for the passive nitrogen dioxide detector tubes provided and analysed by Severn Trent Laboratories.

In July 2005, Bridgend County Borough Council's Local Air Quality Management Progress Report recommended that:

- All currently held data should be, as far as possible, ratified.

- Data shall continue to be gathered from the three sites identified in the June 2003 USA to enable conclusions to be drawn on the current and future air quality at these locations. The results will be presented in a Detailed Assessment of Air Quality at these locations by 31st December 2005.

- The mobile PM_{10} and NO_x monitoring station should be added to the Welsh Air Quality Forum Network of sites and receive appropriate Quality Assurance and Quality Control (QA/QC) to validate any data gathered.

In March 2006 a Detailed Assessment for Nitrogen Dioxide and Particles (PM_{10}) was and concluded that the current air quality objectives for nitrogen dioxide and particles PM_{10} are being met and that the 2010 Air Quality Daughter Directive limit value for nitrogen dioxide will also be achieved at the three road junctions assessed. However, it also recommended that monitoring data from the three road junction sites identified in the June 2003 USA should continue to be gathered to enable assessment of future air quality at these locations.

Third Round of Review and Assessment

Bridgend County Council published its second USA in May 2006. The assessment concluded that there was no requirement to proceed to a detailed assessment for any pollutant in Bridgend County Borough.

The Council published Progress Reports in 2007 and 2008. Both reports coincided with one another, issuing similar conclusions and recommendations. They indicated that no air quality objectives prescribed in the Air Quality (Wales) Regulations 2000 and the Air Quality (Amendment) (Wales) Regulations 2002 will be breached at any relevant locations.

In terms of monitoring locations, the reports highlighted the following:

- Data on NO_2 concentrations will continue to be gathered at relevant locations adjacent to A48 Ewenny Cross, the western end of Cowbridge Road and at Tondu Road on the western end of the Bridgend Cross Valley Link Road.

- Monitoring of PM_{10} and NO_2 will continue at Kenfig Hill adjacent to the opencast coal site operated by Celtic Energy Ltd.

- Monitoring of NO_2 and sulphur dioxide (SO_2) will take place at relevant locations adjacent to Rockwool Ltd, Wern Fawr, Pencoed when the new factory extension becomes operational.

Fourth Round of Review and Assessment

The Bridgend County Borough Council published its third USA in June 2009. There was no evidence of any significant breaches of the air quality objectives prescribed in the Air Quality

(Wales) Regulations 2000 and the Air Quality (Amendment) (Wales) Regulations 2002, at any relevant locations. The report did however draw attention upon an ongoing trend for NO_2 concentrations at Ewenny Cross, Bridgend, and Tondu Road, Bridgend, at the façade of the nearest houses, to be at or close to the air quality objective for NO_2 for 2007. It was decided that monitoring would continue at the two highlighted sites as part of an ongoing Detailed Assessment to be produced later that year.

The 2010 Progress Report stated the following:

The conclusions for the new monitoring data in relation to Ewenny Cross and Tondu Rd show that Ewenny Cross has exceeded the annual mean National Air Quality Objective for nitrogen dioxide (NO_2) and this will be reported in depth in the Detailed Assessment to be produced later this year.

The results for nitrogen dioxide at Tondu Rd show that the annual mean National Air Quality Objective for nitrogen dioxide (NO_2) has not been exceeded. However, in view of the results which are very close to the objective, monitoring will continue at this location for at least another year.

There are no new local developments likely to give rise to a significant impact on air quality within the County Borough.

There are no other issues that give rise to concern in terms of impact on air quality within the County Borough.

The Detailed Assessment for Ewenny Cross is near completion and will be produced in May 2010. A further progress report will be produced early in 2011.

The 2010 Detailed Assessment for Ewenny Cross was subsequently submitted and stated:

This Detailed Assessment of Air Quality has shown that the current air quality objectives for nitrogen dioxide (NO_2) are not being met at the southwestern sector of Ewenny Cross, Bridgend but are being met at the Bridgend Cross Valley Link, Tondu Road, Bridgend.

In view of the above, the following recommendations have been made:

-Monitoring should continue at its present level at the Bridgend Cross Valley Link, Tondu Road and at Ewenny Cross, Bridgend.

-A continuous monitor, together with a meteorological station, should be installed at or as near to the southwestern sector of Ewenny roundabout as is practical.
Following discussions with Welsh Assembly Government and University of the West of England (UWE) it was decided that the Detailed Assessment should remain ongoing and that any decision

to declare an AQMA for Ewenny Cross should be delayed until continuous monitoring data for 2010 has been collated and analysed.

The 2011 Progress report stated the following:

Following the Detailed Assessment submitted in June 2010 and the response from WAG, the Authority decided, in consultation with WAG and UWE to defer a decision to declare an AQMA for Ewenny Cross until a full calendar year of continuous monitoring data had been collated and analysed.

Due to equipment failure and contractual issues, continuous monitoring at Ewenny Cross has been significantly delayed. Continuous sampling commenced in March 2011 as did a diffusion tube co-location study.

The conclusions from annualised monitoring data obtained since the last report show that one sampling point at Ewenny Cross has exceeded the annual mean National Air Quality Objective for nitrogen dioxide (NO_2). The other nine around the Cross remain within the annual mean National Air Quality Objective.

The results for nitrogen dioxide diffusion tube monitoring at Tondu Rd show that the National Air Quality Objective's annual mean for nitrogen dioxide (NO_2) has not been exceeded. However, results are very close to the objective and monitoring will continue at this location for another year.

No continuous PM_{10} data could be retrieved for South Cornelly or Kenfig Hill due to equipment failure.

The nitrogen dioxide diffusion tube sampling locations in Maesteg town centre which were set up in July 2010 following local concerns have shown to date, an exceedance at one sampling point. As a result, more monitoring location points have been put in place and will be reported upon in the next USA report.

Fifth Round of Review and Assessment

Bridgend County Council published its fourth USA May 2012. In addition, a Detailed Assessment was submitted for Ewenny Cross. The reports identified:

- There were no indications of any significant breaches of the air quality objectives prescribed in the Air Quality (Wales) Regulations 2000 and the Air Quality (Amendment) (Wales) Regulations 2002.

-There was an exceedance of the objective for Nitrogen Dioxide at one location in Maesteg. However, this was marginal and the other sample points in the immediate vicinity were below the National Objectives for Nitrogen Dioxide. Monitoring continued at this site and extra sample sites, in addition to those already in place were set up where practicable. The data so far for this location, in view of the above, does not suggest that a Detailed

Assessment is necessary at this time, although this will be subject to review as more data is collected and analysed.

-The positioning of an Automated Continuous NOx Analyser and co-location study at Ewenny Cross has provided robust information as to the air quality situation and indicates that Nitrogen Dioxide levels do not exceed the National Air Quality Objectives. This Automated Continuous NOx Analyser will be retained at this site to gather more data over the coming year.

-The Detailed Assessment 2012 completed in tandem with this Report concluded that it is not necessary at this point in time to proceed with declaring an Air Quality Management Area at Ewenny Cross. The situation will continue to be monitored by way of the co-location study utilising the Automated Continuous NOx Analyser and the numerous Nitrogen Dioxide Diffusion Tube sites situated at Ewenny Cross.

The 2013 Progress report provided the following findings and recommendations:

- The Report has not identified a need to proceed to a Detailed Assessment for any pollutant.

- The Report has identified a need to continue monitoring for Nitrogen Dioxide in Maesteg Town Centre.

- Monitoring of Nitrogen Dioxide and PM_{10} will continue at the same sites as at the end of 2012.

The Automated Continuous NOx Analyser and co-location study will continue at Ewenny Cross Roundabout for this year to acquire more robust data. In the light of the acquired data, the positioning and possible relocation of the Automatic Monitoring Station will be decided at the end of 2013.

Bridgend County Borough Council will submit a Progress Report in May 2014.

The 2014 Progress report stated the following:

- the exception of Ewenny Cross Roundabout as highlighted above; the Progress Report has not identified a need to consider proceeding to a Detailed Assessment for any other pollutant.

- Monitoring of Nitrogen Dioxide and PM_{10} will continue at the same sites as at the end of 2013.

- Bridgend County Borough Council will submit a progress report in May 2015.

Sixth Round of Review and Assessment

Bridgend County Council published its fourth USA September 2015. The assessment identified no need to proceed to a Detailed Assessment for any pollutant.

2016 Annual Progress Report highlighted no concerns, and no objectives were exceeded.

2017 Annual Progress Report

BCBC's 2017 Annual Progress Report highlighted that air quality within Bridgend County Borough continued to meet the relevant air quality objectives as prescribed in the Air Quality (Wales) Regulations 2000 and the Air Quality (Amendment) (Wales) Regulations 2002.

Reporting described the amendments to the non-automatic NO_2 network with 10 new locations commissioned for 2017.

Quality and technical issues were outlined regarding the automatic monitoring at Ewenny Cross Roundabout, for both NO_2 and PM_{10}. The inability to conform to the frequency of calibration checks and technical issues faced with the PM_{10} Met One E Sampler were noted. Data capture was also an issue at the Rockwool Ltd site for SO_2 monitoring, recorded at 47.1%.

2018 Annual Progress Report

BCBC's 2018 Annual Progress Report highlighted elevated and exceeding annual average levels of nitrogen dioxide (NO_2) and outlined the requirement to proceed to implement and formalise an Air Quality Management Area (AQMA) Order for Park Street, Bridgend. On January 1st 2019 an official AQMA Order was raised for Park Street, Bridgend, designated on the basis of exceeding annual average NO_2 air quality objectives/ limit values.

2019 Annual Progress Report

BCBC's 2019 Annual Progress Report highlighted general compliance for monitoring undertaken in 2018, however it did note the elevated and exceeding annual average levels of nitrogen dioxide (NO_2), especially within and close to the established Park Street AQMA boundary. The report outlined the works initiated to develop an effective Air Quality Action Plan (AQAP) to support the AQMA. In doing so the report highlighted the commitment of a designated work steering group to develop appropriate mitigation measures that would not only benefit the Park Street AQMA "hot spot" but would also generate wider air quality benefits to improve and protect the amenity of public health. The report specified commitments to gather public engagement on the AQAP's development via public drop-in sessions through the course of December 2019. It outlined how suggested mitigation measures would be assessed and

indicated that detailed transportation and air quality modelling would be required to quantify the impacts derived by any preferred options. The report also noted the need for enhanced monitoring capabilities in the form of automated monitoring within the Park Street AQMA to improve understanding and provide a platform for public to access data.

2020 Annual Progress Report

BCBC'S 2020 Annual Progress Report showed continued elevated and exceeding levels of NO2 at sensitive receptor locations situated on Park Street within the established AQMA Order boundary. Development of Air Quality Action Plan (AQAP) continued, and full approval was given to locate an automatic monitoring station within the Park Street, Bridgend AQMA. Despite the areas of concern within the Park Street AQMA, compliance with the air quality objectives was achieved at all other monitoring locations.

2021 Annual Progress Report

The 2021 Annual Progress Report shown a reduction in NO_2 concentrations at all locations, although still slightly exceeding the annual air quality objective at two locations within Park Street. Monitoring continued at all locations within the Park Street AQMA with the addition of an automatic air quality monitoring station in December 2020.

1.2 Air Quality Management Areas

Park Street AQMA

Welsh Government's (WG) Policy Guidance[5] states;

4.8 A Local Authority must by order designate as an AQMA any part of its area in which it appears one or more of the national air quality objectives is not being achieved or is not likely to be achieved.

4.11 Local Authorities should declare or extend an AQMA as soon as possible after recognising the need for it to be declared or extended. A copy of the new or amended

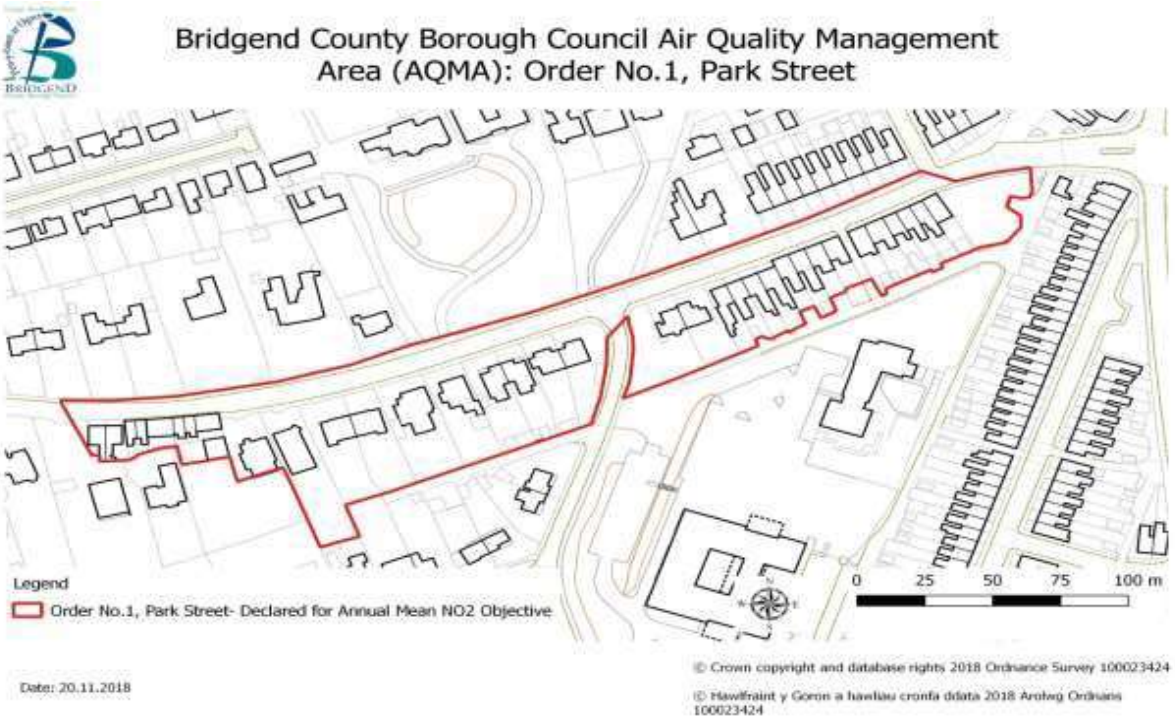
[5] https://gov.wales/sites/default/files/publications/2019-04/local-air-quality-management-in-wales.pdf

AQMA order should be submitted to the Welsh Government and Defra, together with a GIS shape file of the AQMA boundary. The ordermust also be made public and drawn to the attention of people living and working within the AQMA boundary.

Based on the 2017 NO_2 datasets, in accordance with WG's Policy Guidance and Section 83 of the Environment Act 1995, SRS/ BCBC is legally required to declare an Air Quality Management Area (AQMA) for Park Street, and in doing so raise an AQMA order that defines the detail and locality of the AQMA.

The Park Street, Bridgend AQMA Order was officially implemented on the 1st of January 2019. The area comprising the Bridgend County Borough Council Air Quality Management Area Order No. 1, Park Street is that contained within the following boundary.

The designated area borders the green space area prior to the rear entrance of properties located on Sunnyside Road. The designated area incorporates all north facing properties, including their open space areas between 39 Park Street and 105 Park Street. The boundaries' northern side borders the open spaceareas that front the south facing properties encapsulating the public access pathway.

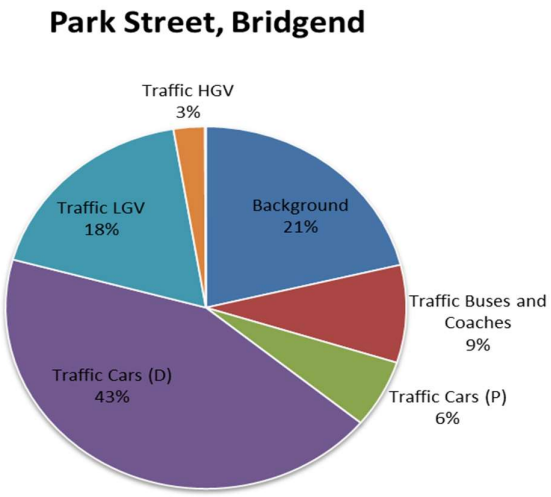


1.3 Source Apportionment Analysis

Using the available 2017 DfT manual count data and adopting the guidance outlined in Local Air Quality Management (LAQM) Technical Guidance 16, Box 7.5, the percentage proportion of various vehicle classifications contributing towards measured annual average NO_2 concentrations has been quantified.

The analysis confirms that a large percentage of NO_2 levels experienced at sensitive receptor locations along Park Street is attributed by cars (predominantly diesel models), as well as Light Goods Vehicles (LGVs). The analysis is detailed in Figure 6:

Figure 6 - Park Street NO_2 Source Apportionment Assessment



It can thus be concluded that diesel cars are overwhelmingly the main contributor to NO_2 concentrations; therefore, reducing the number of diesel cars (and queuing) on Park Street should bethe focus of the action plan for the Park Street AQMA.

1.4 Diesel Cars and Increased NO_2

The high contribution of diesel cars to NOx emissions and the resulting concentrations of NO_2 is something that has been widely acknowledged and is an unwanted consequence of a

greater uptakeof diesel cars due, in part, to government incentives to reduce emissions of carbon dioxide.

Although NOx emissions overall have been declining because of improved engine technology and the transition to electric vehicles, primary NO_2 emissions have increased due to technology designed to lower the emissions of particulate.This is explained in the scientific article 'Emission reduction versus NO_2 air quality concentrations, a trade-off?' by Peter J Sturm and Stefan Hausberger of Graz University of Technology, Austria[6].

'The reasons for increasing NO_2 *shares are mainly a catalytic exhaust gas after treatment such asdiesel oxidation catalysts and coated diesel particulate filter (DPF) and the increasing exhaust gas recirculation rates for modern vehicles. High* NO_2 *levels at the raw exhaust gas are desired for the passive regeneration of the DPF at lower exhaust gas temperatures. Thus, the exhaust gas after treatment to reduce fine particle emissions is at least partly responsible for the actual* NO_2 *situation.*

In accordance with WG's Policy Guidance:

> *4.12 A draft action plan must be produced for review by the Welsh Government within* ***18 months*** *of the coming-into-force date of the AQMA order, and the action plan must be* ***formally adopted beforetwo years have elapsed.*** *A Local Authority failing to produce a draft action plan for review by the Welsh Government within two years of declaring or extending an AQMA will, in the absence of a compelling explanation, be issued with a direction from the Welsh Ministers under section 85(3) of the1995 Act.*

To develop ideas and ensure an effective AQAP which considers all aspects prioritising public health, an AQAP Work Steering Group has been established consisting of representatives from Bridgend's internal departments of interest, as well as persons from the local Public Services Board (PSB).

In addition to the discussions held by the AQAP Work Steering Group, several informal 'drop-in' sessions were facilitated by the Council in December 2019 which provided opportunity for the public to find out more about air quality in the area, AQAP updates and suggest ideas for the AQAP.

6 https://online.tugraz.at/tug_online/voe_main2.getVollText?pDocumentNr=145519&pCurrPk=52228

Collaborating the ideas and suggestions made to date, a list of proposed mitigation measures has beencompiled. Table 2 documents the proposed list of mitigation measures for the Park Street AQMA. A further description of each action is provided in the text below .

A qualitative cost benefit analysis assessment has also been provided for each action as detailed in Table 3. The potential actions have been scored for cost benefit and the resulting rank to identify the most deliverable actions. Estimated costs (1 for high cost to 5 for low cost) were multiplied by a sum of the likely benefit from reducing pollution and people's exposure to the pollution (10 for high and 1 for low) to provide a score. The highest score shows the greatest cost benefit according to the opinions of the project team. The measures in Table 3 are listed in order of their ranking score, with the most deliverable at the top.

It is acknowledged that some measures may score highly despite not affecting air pollution, because they instead may help reduce people's exposure to the pollution.

To note; following this indicative Cost Benefit Analysis it has been agreed by the AQAP Work Steering Group to assess in more detail mitigation options that will manage and improve traffic flows through the Park Street AQMA. As previously outlined queuing and inconsistent traffic flows would appear to be the principal cause of the portrayed poor air quality levels. It is also concerning given the level of surrounding development that has been scheduled, as there is the likelihood of increased pressure on the network and consequentially air quality levels along Park Street. It is necessary that to proceed with the development of a successful and meaningful AQAP the Council need to undertake detailed transport and air quality assessments to ensure that correct mitigation measures are considered before any implementation.

Table 2 - Proposed AQAP Mitigation Measures for Park Street AQMA

No.	Measure	EU Category	EU Classification	Responsibility/ Lead Authority	Key Performance Indicator	Target Annual Emission Reduction in the AQMA	Associated Improvements	Timescale
1	Public health information campaign (highlight most vulnerable groups and people with certain health concerns; asthmatics, Chronic Obstructive Pulmonary Disease etc.). Increase public education messages which promote healthier choices for short journeys (<2 miles).	Public Information	Via the internet/ leaflets/ other	Cwm Taf Morgannwg University Health Board/ Public Health Wales/ BCBC/ SRS/ Charity organisations; Global Action Plan; Living Streets/ TfW	The number of hits on website. Number of initiatives delivered. Delivery of a public education campaign. Cross reference obtained air quality results to the applicable air quality objectives. Improvements to those figures outlined in Bridgend LTP 2015 using data acquired by 2011 Census. The 2011 census total, 59,235 of Bridgend residents travelled to work with **82.5%** travelling by car, or 83% including taxis. About **75%** of car users were classified as the driver which meant that they travelled alone; 5.5% used public transport; 9% walked or cycled with cycling contributing less than 1% (0.8%); other transport modes including motorcycle constituted 1.1%	No reduction in concentration in Nitrogen Dioxide, however there would be an exposure reduction for residents.	Improved capacity on road network/ reduced congestion/ improved journey times. Improved public awareness. Related health improvements.	Unknown
2	Support the creation of a local "Air Quality Action Group".	Public Information	Via the internet/ leaflets/ other	BCBC/ SRS/ Local Communities Forum/ local Cllrs	Number of associated members.	Negligible	Improved awareness of the issues locally	Unknown

No.	Measure	EU Category	EU Classification	Responsibility/ Lead Authority	Key Performance Indicator	Target Annual Emission Reduction in the AQMA	Associated Improvements	Timescale
3	Increase the monitoring capabilities of the Council with investment in more air quality monitoring techniques. Creation of an online platform linked to the Air Quality Index.	Public Information	Via the internet	BCBC/ SRS; possibility to link with Public Health Wales and an appointed approach in Cardiff.	Cross reference obtained air quality results to the applicable air quality objectives.	N/A	Improved Public awareness. Improved understanding for air quality trends with the production of diurnal datasets. Increased understanding for other associated pollutants; PM10/ PM2.5.	Ongoing
4	Electronic "pollutant signage" within AQMA and local area; Signage encourages drivers to switch off their engines in standing traffic queues, linked to signalling. Example; "Do you need to drive today?"	Public Information/ Traffic Management	Other	BCBC/ SRS	Cross reference obtained air quality results to the applicable air quality objectives.	Unknown	Improved Public awareness/ Increase in the use of sustainable alternatives.	Unknown.
5	Signs and banners for engine idling; Signage at key intersections, near junctions and on public transport / taxis encouraging people to switch off	Public Information/ Traffic Management	Other	BCBC/ SRS	Cross reference obtained air quality results to the applicable air quality objectives.	Unknown	Improved Public awareness.	Unknown.

No.	Measure	EU Category	EU Classification	Responsibility/ Lead Authority	Key Performance Indicator	Target Annual Emission Reduction in the AQMA	Associated Improvements	Timescale
6	Develop Supplementary Planning Guidance (SPG) to provide a specific guidance for air quality in accordance with new developments.	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	BCBC/ SRS	Production of an SPG.	N/A.	Improved Street Scene. Improvements for other environmental factors such as noise and odour. Optimise the planning process. Reduced congestion.	Ongoing
7	Planning guidance for the provision of Electric Vehicle Charging Points. To note; EV points are now compulsory in England	Policy Guidance and Development Control	Other	BCBC	Number of properties where a power spur for an electric vehicle charge point is installed. Number of planning applications approved with a vehicle charge point as an advisory or required condition.	Unknown	% reduction in NOx emissions compared to a diesel/ petrol. Reduction in PM10 and PM2.5, although some studies do suggest increases associated with EV, therefore enhanced monitoring capabilities particularly for PM is crucial.	Unknown

No.	Measure	EU Category	EU Classification	Responsibility/ Lead Authority	Key Performance Indicator	Target Annual Emission Reduction in the AQMA	Associated Improvements	Timescale
8	Revise BCBC's Walking and Cycling Strategy; Revise the existing 2009 document	Policy Guidance and Development Control/ Promoting Travel Alternatives	Promotion of cycling	BCBC/ SRS	Production of a revised document.	N/A	Related Health improvements. % reduction in NOx emissions compared to a diesel/ petrol. Reduction in PM10 and PM2.5.	Unknown
9	Endorse SP19; Biodiversity and Development. Further influence the use of green infrastructure for new developments.	Policy Guidance and Development Control	Other	BCBC/ SRS	Number of trees planted.	Unknown. Provision of a barrier to protect residents and visitors.	Improved street scene. Absorption of Greenhouse gas emissions.	Ongoing
10	Implement 'smoke control zone' for Bridgend. Wood burners installations would need authorisation to operate and receive permissions in accordance with the Clean Air Act.	Policy Guidance and Development Control	Other policy	BCBC/ SRS	Number of nuisance complaints generated.	Unknown	% reduction in NOx emissions. Reduction in PM10 and PM2.5.	Unknown
11	School Active Travel Plans	Promoting Travel Alternatives	Incentivise active travel campaign & infrastructure	BCBC/ SRS/ Living Streets "WOW" Scheme/ Sustrans/ WG Young Dragons Educational Package/ Global Action Plan	Number of participating schools.	N/A	Related Health improvements. Improved public awareness.	Ongoing

No.	Measure	EU Category	EU Classification	Responsibility/ Lead Authority	Key Performance Indicator	Target Annual Emission Reduction in the AQMA	Associated Improvements	Timescale
							Reduced Congestion.	
12	Encourage/ Facilitate homeworking. BCBC/ SRS is one of the largest employers in Bridgend and therefore could look to adopt more flexible/ agile working patterns	Promoting Travel Alternatives	Encourage / Facilitate homeworking.	BCBC/ SRS	Produce Healthy Travel Charter. Number of individuals enrolled on programme.	Unknown	Quality of life improvements. Saved costs on office space. Eliminate time lost travelling to office meaning shorter working days. Reduced congestion during peak times.	
13	Work with local businesses to develop active travel to work programme's. Cardiff Staff Travel Charter currently being rolled out but only for public sector establishments.	Promoting Travel Alternatives	Other	BCBC/ Cwm Taf Morgannwg University Health Board/ Public Health Wales.	Produce Healthy Travel Charter. Number of individuals enrolled on programme.	Unknown	Quality of life improvements. Saved costs on office space. Eliminate time lost travelling to office meaning shorter working days. Reduced congestion during peak times.	

No.	Measure	EU Category	EU Classification	Responsibility/ Lead Authority	Key Performance Indicator	Target Annual Emission Reduction in the AQMA	Associated Improvements	Timescale
14	Park and Ride facilities to be implemented at strategic sites (Broadlands)/ Shuttle bus service linking Bridgend train station to strategic points (Broadlands/ Hospital/ Coity/ McArthur Glen). There is also the potential to look at shared shuttle service for persons accessing proposed Health Centres.	Alternatives to private vehicle use	Bus Park and Ride scheme	BCBC/ Bus operators/ TfW	Bus patronage figures.	Unknown	Reduced congestion during peak times. Bus services profit.	
15	Anti-idling implemented as TROs specific to sensitive areas such as outside schools, hospitals, care homes, as well as Park Street AQMA. **Under Road Traffic (Vehicle Emissions) (Fixed Penalty) Regulations 2003, regulation 6 (3) BCBC has the power to implement "no vehicle idling" areas. BCBC will need to assess the feasibility and likely benefits.**	Traffic Management	Anti-idling enforcement	BCBC	Cross reference obtained air quality results on Park Street to the applicable air quality objectives.	Anti-idling implemented as a TRO specific to Park Street AQMA.	Related Health improvements. Improved public awareness.	

No.	Measure	EU Category	EU Classification	Responsibility/ Lead Authority	Key Performance Indicator	Target Annual Emission Reduction in the AQMA	Associated Improvements	Timescale
	Run this as a pilot study.							
16	Introduce a pilot scheme "20mph speed limit" to Park Street.	Traffic Management	Reduction of speed limits	BCBC	Evaluation of annual air quality datasets for NO2. Reduction in vehicle speeds via traffic flow analysis Any marked improvement in collision/ incident rates. Cross reference obtained air quality results on Park Street to the applicable air quality objectives.	Unknown	Improved road safety.	
17	Ghost right hand turn onto Heol-Y-Nant.	Traffic Management	Strategic highway improvement	BCBC	Reduction in capacity captured via traffic flow analysis.	Unknown	Reduced congestion.	Completed February 2022.
18	Deny all access onto St Leonard's Road for all traffic movements.	Traffic Management	Strategic highway improvement	BCBC	Cross reference obtained air quality results on Park Street to the applicable air quality objectives.	Unknown	Reduced congestion. Improved Road Safety.	
19	Deny a through route movement from Angel Street onto Park Street.	Traffic Management	Strategic highway improvement	BCBC	Reduced capacity on Park Street captured via traffic flow analysis.	Unknown	Reduced Congestion on Park Street.	

No.	Measure	EU Category	EU Classification	Responsibility/ Lead Authority	Key Performance Indicator	Target Annual Emission Reduction in the AQMA	Associated Improvements	Timescale
20	Optimise the traffic signals at the Tondu Rd/ Park Street/ Angel Street Junction- Adopt a MOVA system. Utilise external consultancy expertise to undertake a feasibility study.	Traffic Management	Strategic highway improvement	BCBC/SRS/ Externally Appointed Consultant	Reduced capacity on Park Street captured via traffic flow analysis. Cross reference obtained air quality results on Park Street to the applicable air quality objectives.	Unknown	Improved road junction efficiency. Reduced Congestion	
21	Implement a 4-phase junction (3 traffic, 1 pedestrian) at the Heol-y-Nant turning	Traffic Management	Strategic highway improvement	BCBC/SRS/ Externally Appointed Consultant	Reduced capacity on Park Street captured via traffic flow analysis. Cross reference obtained air quality results on Park Street to the applicable air quality objectives.	Unknown	Improved road junction efficiency. Reduced Congestion	
22	Bus Programme- Strategic Bus Network. Buses not to use St Leonard's Road due to the experienced access constraints	Transport Planning and Infrastructure	Bus Route Improvements	BCBC/ Bus Operators	Customer satisfaction questionnaires from the bus operators.	Unknown	Improved Road safety at the Park Street/ St Leonard's Junction. Reduced congestion on Park Street.	

No.	Measure	EU Category	EU Classification	Responsibility/ Lead Authority	Key Performance Indicator	Target Annual Emission Reduction in the AQMA	Associated Improvements	Timescale
	onto and off Park Street.							

1.5 Implementation of Action Plan

As highlighted, the unprecedented circumstances of Covid-19 have had an impact on the local air quality monitoring and the development of the action plan for the Park Street AQMA, in terms of its scheduling and delivery. Welsh Government have been made aware of delays to delivering the action plan and making an appropriate decision to undertake any detailed transport and air quality modelling to support the action plan. In doing so Welsh Government recognise the need to allow for an extension period to facilitate the delivery of the DRAFT action plan. It has been confirmed that an extension for the DRAFT action plan has been accepted by Welsh Government's Minister. The draft AQAP is now subject to an ongoing public consultation, which closes on the 21st November 2022.

Following completion of the public consultation BCBC/SRS will review the results of the consultation to enable the finalisation of the AQAP with a view that a final AQAP is approved in early 2023 in advance of the final AQAP being submitted to Welsh Government.

The final AQAP will provide a full implementation timeline of the preferred measures.

Table 3 - Cost Benefit Analysis Park Street AQMA

Measure No.	Cost benefit (cost x [pollution reduction + exposure reduction] = score)					
	Measure	**Cost** 1 = >£1m 2 = £250k-1m 3 = £50k - 250k 4 = £10k - £50k 5 = <£10k	**Air pollution reduction** 10 = greatest air quality gain 1 = least air quality gain	**Exposure reduction** 10 = greatest exposure reduction 1 = least exposure reduction	**Score = cost x benefit**	**Rank** **1 = most cost benefit effective**
20	Optimise the traffic signals at the Tondu Rd/ Park Street/ Angel Street Junction.	4	6	2	32	1
1	Public health information campaign.	5	2	4	30	2
15	Anti-idling implemented as TROs specific to sensitive areas such as outside schools, hospitals, care homes, as well as Park Street AQMA.	5	4	2	30	2
18	Deny all access onto St Leonard's Road for all traffic movements.	4	5	2	28	3
6	Develop Supplementary Planning Guidance (SPG).	5	3	2	25	4
16	Introduce a pilot scheme "20mph speed limit" to Park Street.	5	3	2	25	4

Measure No.	Cost benefit (cost x [pollution reduction + exposure reduction] = score)					
	Measure	**Cost** 1 = >£1m 2 = £250k-1m 3 = £50k - 250k 4 = £10k - £50k 5 = <£10k	**Air pollution reduction** 10 = greatest air quality gain 1 = least air quality gain	**Exposure reduction** 10 = greatest exposure reduction 1 = least exposure reduction	**Score = cost x benefit**	**Rank** **1 = most cost benefit effective**
7	Planning guidance for the provision of Electric VehicleCharging Points.	5	3	1	20	6
2	Support the creation of a local "Air Quality Action Group".	5	2	1	15	7
10	Implement 'smoke control zone' for Bridgend.	5	2	1	15	7
12	Encourage/ Facilitate homeworking.	5	2	1	15	7
17	Ghost right hand turn ontoHeol-Y-Nant.	5	2	1	15	7

Measure No.	Cost benefit (cost x [pollution reduction + exposure reduction] = score)					
	Measure	**Cost** 1 = >£1m 2 = £250k-1m 3 = £50k - 250k 4 = £10k - £50k 5 = <£10k	**Air pollution reduction** 10 = greatest air quality gain 1 = least air quality gain	**Exposure reduction** 10 = greatest exposure reduction 1 = least exposure reduction	**Score = cost x benefit**	**Rank** **1 = most cost benefit effective**
14	Park and Ride facilities to be implemented at strategic sites.	2	4	3	14	8
4	Electronic "pollutant signage" within AQMA and local area.	3	2	2	12	9
5	Signs and banners for engine idling	3	2	2	12	9
11	School Active Travel Plans	4	2	1	12	9
22	Bus Programme- Strategic Bus Network.	3	2	2	12	9
3	Increase the monitoring capabilities of the Council.	4	1	2	12	9
19	Deny a through route movement from Angel Street onto Park Street.	4	2	1	12	9

Measure No.	Cost benefit (cost x [pollution reduction + exposure reduction] = score)					
	Measure	**Cost** 1 = >£1m 2 = £250k-1m 3 = £50k - 250k 4 = £10k - £50k 5 = <£10k	**Air pollution reduction** 10 = greatest air quality gain 1 = least air quality gain	**Exposure reduction** 10 = greatest exposure reduction 1 = least exposure reduction	**Score = cost x benefit**	**Rank** **1 = most cost benefit effective**
8	Revise BCBC's Walking and Cycling Strategy.	5	1	1	10	10
9	Endorse SP19; Biodiversity and Development. Further influence the use of green infrastructure for new developments.	5	1	1	10	10
13	Work with local businesses to develop active travel to work programmes.	5	1	1	10	10

1.6 Detailed Transport and Air Quality Assessment

As previously discussed, queuing and inconsistent traffic flows appear to be the principal cause of the measured poor air quality levels in the Park Street AQMA. After the Cost Benefit Analysis, it has been agreed by the AQAP Work Steering Group to assess in more detail mitigation options that will manage and improve traffic flows through the Park Street AQMA, with the principal objective to reduce NO_2 concentrations in line with air quality objectives.

The preferred options of the initial draft AQAP included the following three options under a Do Minimum and Do Something Scenario:

Do Minimum

- Introduction of a right turn holding lane at the Junction of Park Street with Heol y Nant (Measure 17). This was implemented by the developer (Persimmon) of the former Ysgol Bryn Castell site (Llangewydd Road, Cefn Glas) under the requirement of Condition 27 of Planning consent P/18/1006/FUL. It was opened to traffic in February 2022.

DoSomething

- Deny all access onto St Leonards Road (Measure 18);
- Implementation and optimisaiton of 4-phase junction at Park Street. Angel Street/ Tondu Road Junction (Measure 20).

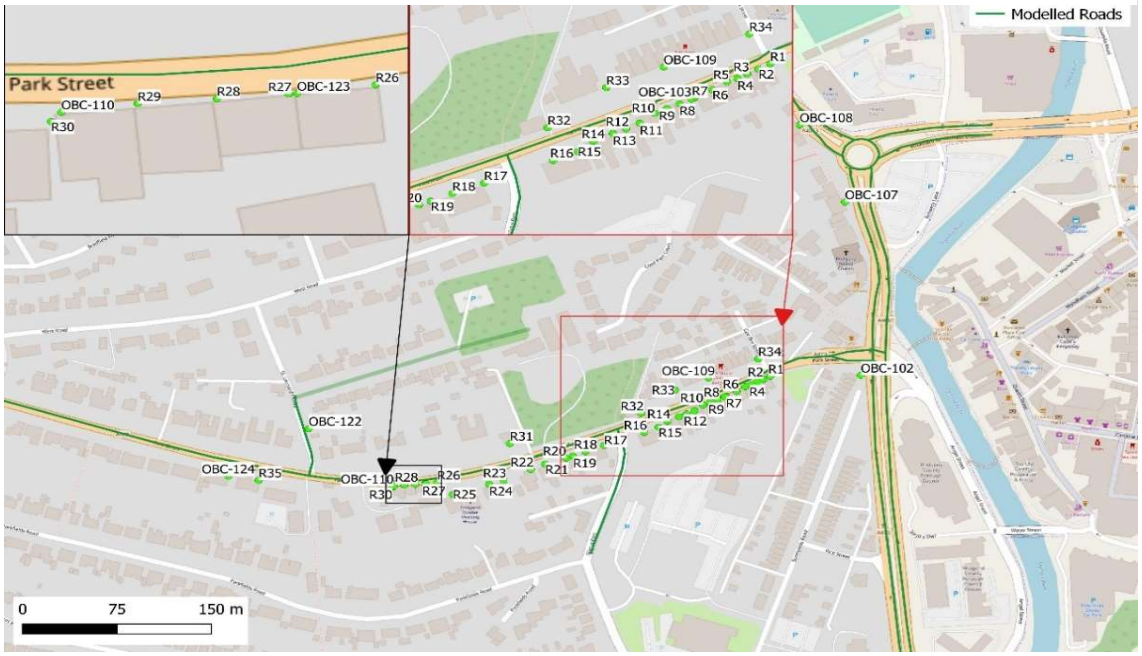
SRS/ BCBC commissioned external consultants to undertake transport and air quality modelling work for the above options to illustrate any benefits to nitrogen dioxide currently identified as exceeding objective limits. Since the above measures work in conjunction with one another, the two scenarios where transport and air quality modelling have been undertaken would assess two options cumulatively as one preferred scenario.

To fully assess the impacts on air quality, the air quality dispersion model has identified 35 receptor points along Park Street and surrounding streets in addition to modelling concentrations at the existing monitoring locations on Park Street. These locations allow an assessment of relevant exposure across a wider area to assess the impact of the interventions.

The study area includes all roads within 200 metres of the AQMA in the traffic model and the A473 between Boulevard de Villenave d'Ornon/Tondu Road roundabout and the junction with Merthyr Mawr Road. Traffic changes have been screened between the DM and DS scenario to establish if there is the potential for traffic flow increases to cause a significant worsening of air quality. Traffic flow changes were compared against screening criteria within Table 6.2 of the Institute for Air Quality Management's Land-Use, Planning & Development Control: Planning for Air Quality[7]. There was only one other location outside of study area which breached the traffic screening thresholds, which is Tondu Road north of Boulevard de Villenave d'Ornon/Tondu Road roundabout which is estimated to experience an approx. 1,000 AADT increase. However, OBC-108 presented in Figure 7 - Air Quality Modelling LocationsFigure 7 is estimated to experience concentrations of 24.8$\mu g/m^3$ NO_2 in 2023. OBC-108 is considered a conservative representation of NO_2 concentrations along Tondu Road and 1,000 AADT is not considered a compliance risk for NO_2 air quality objectives given existing concentrations are 24.8 $\mu g/m^3$.

[7] https://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf

Figure 7 - Air Quality Modelling Locations



As detailed in Table 4 below, the implementation of the dedicated right turn from Park Street onto Heol-y-Nant under the DM 2023 scenario provides an improvement in NO_2 concentrations at the worst affected receptors along Park Street, when compared to the base year of 2019. However, several of the **modelled receptor** locations demonstrate continued exceedances of the air quality objective for NO_2.

Table 4 also demonstrates the results of the do something scenario. This includes denying access to St Leonards Road from Park Street and Tondu Road/Park Street, signalling improvements with the addition of the Heol-Y-Nant right turn. The modelled concentrations show further improvements with only two **modelled receptors** slightly exceeding the annual objective limit for NO_2 of 40 µg/m^3 . Concentrations of NO_2 at all existing monitoring locations are identified to be complaint with the air quality objective.

Table 4 - Modelled Air Quality Results Park Street AQMA

Receptor ID	NO_2 ($\mu g/m^3$) Base 2019	NO_2 ($\mu g/m^3$) DM 2023	NO_2 ($\mu g/m^3$) DS 2023	NO_2 ($\mu g/m^3$) DS-DM
R26	56.8	44.6	39.3	-5.4
R27	60.2	47.3	41.6	-5.7
R28	60.5	47.5	41.8	-5.8
R29	57.4	44.9	39.3	-5.6
R30	49.0	38.3	33.6	-4.7
R35	22.0	16.1	16.4	0.3
OBC-124	19.9	14.6	14.9	0.4
OBC-108	29.5	23.7	24.8	1.1

Figure 8 – Comparisons of NO_2 Concentrations from Modelled Scenarios

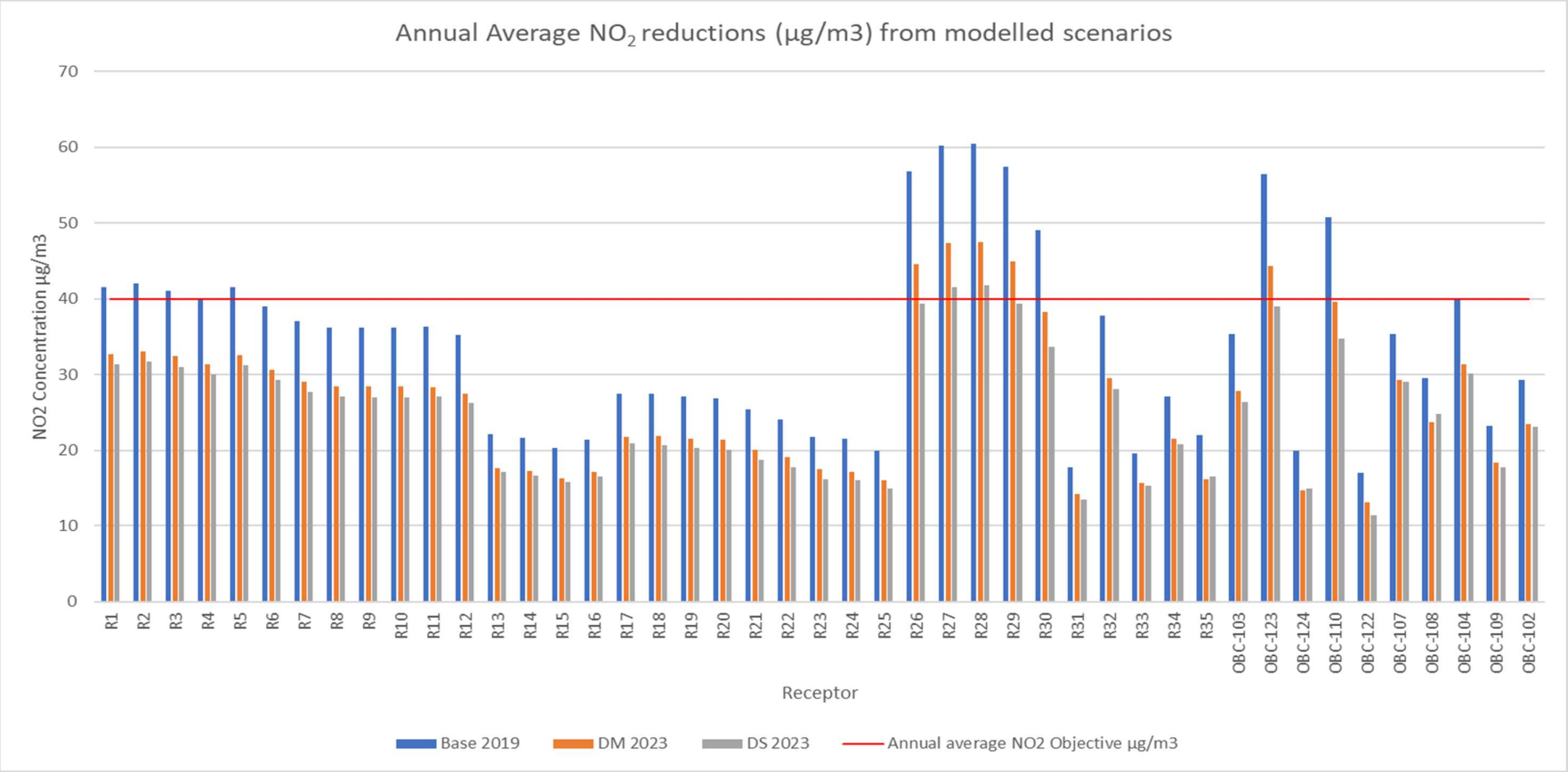


Figure 8 still shows slight exceedances at two receptors with the implementation of the 'do something' scenario, although this still a 12% improved reduction from base 2019 NO_2 concentrations.

Following the detailed modelling work it has been demonstrated that all but two currently monitored locations within the Park Street AQMA are classed as being compliant. Two modelled receptor locations do continue to show exceedance of the NO_2 annual mean after the DS schemes have been implemented. However, when the model uncertainty is factored in, an additional two modelled receptors in the Park Street AQMA are still likely to be in exceedance. The non-compliant and 'at risk' receptors all feature on one row of houses along Park Street, where high concentrations are due to receptors being so close to the road (<1 metre).

It is recommended to implement the changes described in the 'do something' scenario as modelling shows that these changes will decrease Nitrogen Dioxide concentrations by up to 12% at the worst affected receptors. Further measures may also be required to improve air quality for a small section of Park Street to fully achieve compliance with the NO_2 annual mean.

2 Air Quality Monitoring Data and Comparison with Air Quality Objectives

2.1 Summary of Monitoring Undertaken in 2021

2.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how results compare with the objectives.

SRS on behalf of BCBC undertook automatic (continuous) monitoring at the Park Street AQMA site during 2021. Table 5 presents the details of the sites. The monitoring site measures nitrogen dioxide, PM10 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. Monitoring results are available at https://airquality.gov.wales/

A Map showing the location of the automatic monitoring site is provided in Figure

2.1.2 Non-Automatic Monitoring Sites

SRS on behalf of BCBC undertook non- automatic (passive) monitoring of NO_2 at 32 sites during 2021, and Table 6 presents the details of the sites.

Maps showing the location of the monitoring sites are provided in Figure 10. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

Table 5 - Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	Associated with (Named) AQMA?	X OS Grid Reference	Y OS Grid Reference	Pollutants Monitored	Monitoring Technique	Inlet Height (m)	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
AQMA 1	Bridgend Park Street AQMA	Roadside	Y	290040	179704	NO2, PM10	Chemiluminescence / Beta Attenuation Monitor with Gravimetric Equivalence	1.5	4	5.5	1.5

Notes:

(1) 0m indicates that the sited monitor represents exposure and as such no distance calculation is required.

Figure 9 Map of Automatic Monitoring Site in Park Street

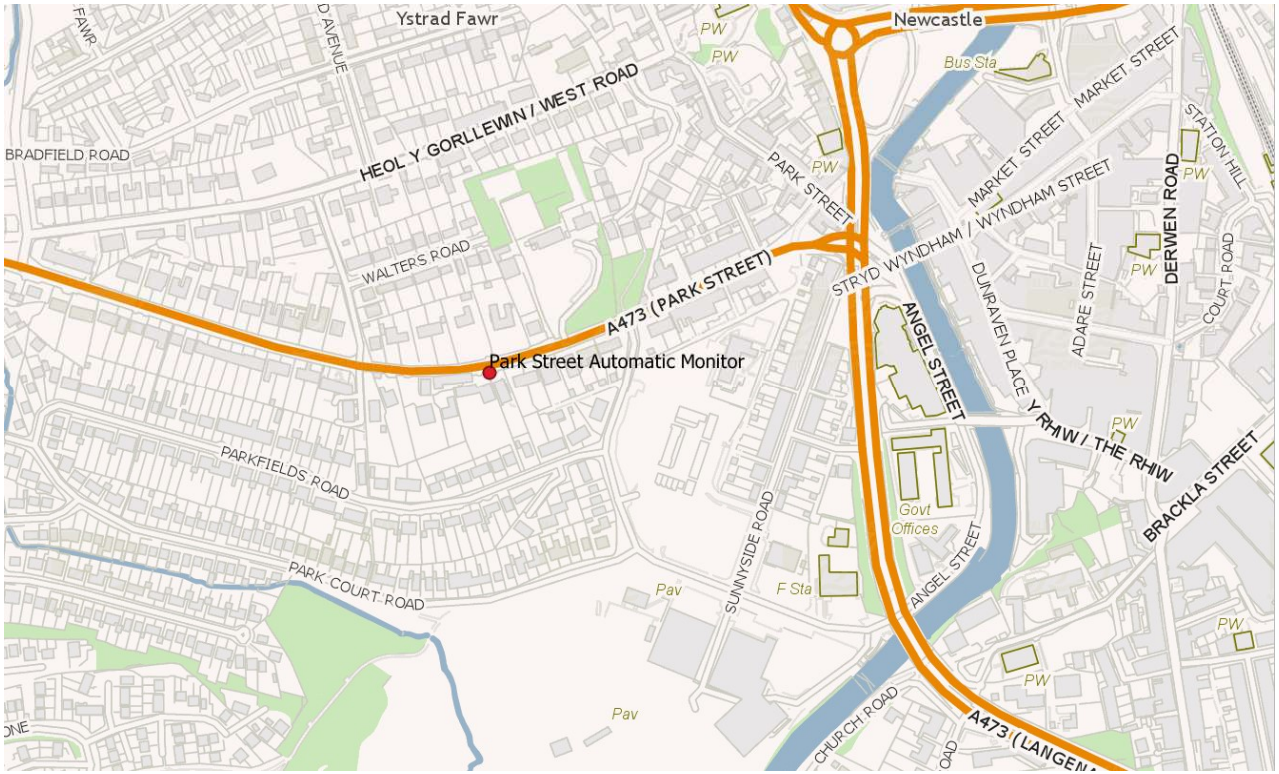


Table 6 - Details of Non-Automatic Monitoring Sites

Site ID	Area	Site Name	Site Type	X OS Grid Ref.	Y OS Grid Ref.	Site Height (m)	Pollutants Monitored	In AQMA	Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with (m) to relevant exposure)	Distance to kerb of nearest road in metres	Worst-case Location?
TONDU ROAD ROUNDABOUT												
OBC-107	A	Tondu Road	Roadside	290347	179959	2	NO_2	N	N	(Y) 0.00	2	Y
OBC-108	A	Tondu Road	Kerbside	290311	180032	2	NO_2	N	N	(Y) 0.00	0.9	Y
EWENNY CROSS ROUNDABOUT												
OBC-113	B	Priory Avenue	Roadside	290616	178394	2	NO_2	N	N	(Y) 0.00	10	Y
OBC-115	B	Ewenny Road	Roadside	290667	178529	2	NO_2	N	N	(Y) 0.00	12	Y
NOLTON STREET/ EWENNY CROSS LINK/ A473 COWBRIDGE ROAD												
OBC-105	C	Cowbridge Road	Roadside	290899	179185	2	NO_2	N	N	(Y) 0.00	4.1	Y

OBC-106	C	Cowbridge Road	Kerbside	290826	179210	2	NO_2	N	N	(N) 3.30	0.9	N
OBC-111	C	Cowbridge Road	Roadside	290700	179305	2	NO_2	N	N	(Y) 0.00	4.95	Y
OBC-112	C	Cowbridge Road	Kerbside	290798	179244	2	NO_2	N	N	(Y) 0.00	0.9	Y
OBC-121	C	Cowbridge Road	Roadside	291540	178734	2	NO_2	N	N	(Y) 0.00	5	Y
BRIDGEND TOWN CENTRE												
OBC-101	D	Bridgend town Centre	Urban Centre	290469	179837	2	NO_2	N	N	(Y) 0.00	1	Y
PARK STREET												
OBC-102	E	Sunnyside Street	Roadside	290354	179807	2	NO_2	N	N	(Y) 0.00	2.95	Y
OBC-103	E	Park Street	Roadside	290250	179782	2	NO_2	Y	N	(Y) 0.00	1.2	Y
OBC-104	E	Park Street	Roadside	290286	179800	2	NO_2	Y	N	(Y) 0.00	1.05	Y
OBC-109	E	Park Street	Roadside	290239	179795	2	NO_2	Y	N	(Y) 0.00	7.5	Y
OBC-110	E	Park Street	Kerbside	289988	179701	2	NO_2	Y	N	(Y) 0.00	0.9	Y
OBC- 122	E	St Leonards Road	Kerbside	289919	179755	2	NO_2	N	N	(N) 4.00	1	N

OBC- 123	E	Park Street	Roadside	290014	179698	2	NO_2	Y	N	(Y) 0.00	0.9	Y
OBC- 124	E	Park Street	Roadside	289859	179710	2	NO_2	N	N	(Y) 0.00	7	Y
OBC-131		Park Street Co-Location	Roadside	290041	179303	1.5	NO_2	Y	Y	(Y) 0.00	1	Y
OBC-131		Park Street Co-Location	Roadside	290041	179303	1.5	NO_2	Y	Y	(Y) 0.00	1	Y
OBC-131		Park Street Co-Location	Roadside	290041	179303	1.5	NO_2	Y	Y	(Y) 0.00	1	Y
COITY ROAD												
OBC-097	F	Coity Road, Bridgend	Roadside	290687	180185	2	NO_2	N	N	(Y) 0.00	5.3	Y
OBC-099	F	Coity Road, Bridgend	Roadside	290663	180251	2	NO_2	N	N	(Y) 0.00	5.6	Y
MAESTEG TOWN CENTRE												
OBC-125	G	Commercial Street, Maesteg	Roadside	285299	191136	2	NO_2	N	N	(Y) 0.00	2	Y
OBC-128	G	Mill Street, Maesteg	Roadside	286218	189805	2	NO_2	N	N	(Y) 0.00	2	Y
PORTHCAWL												
OBC-120	H	New Road. Porthcawl	Kerbside	282264	177237	2	NO_2	N	N	(Y) 0.00	0.9	Y

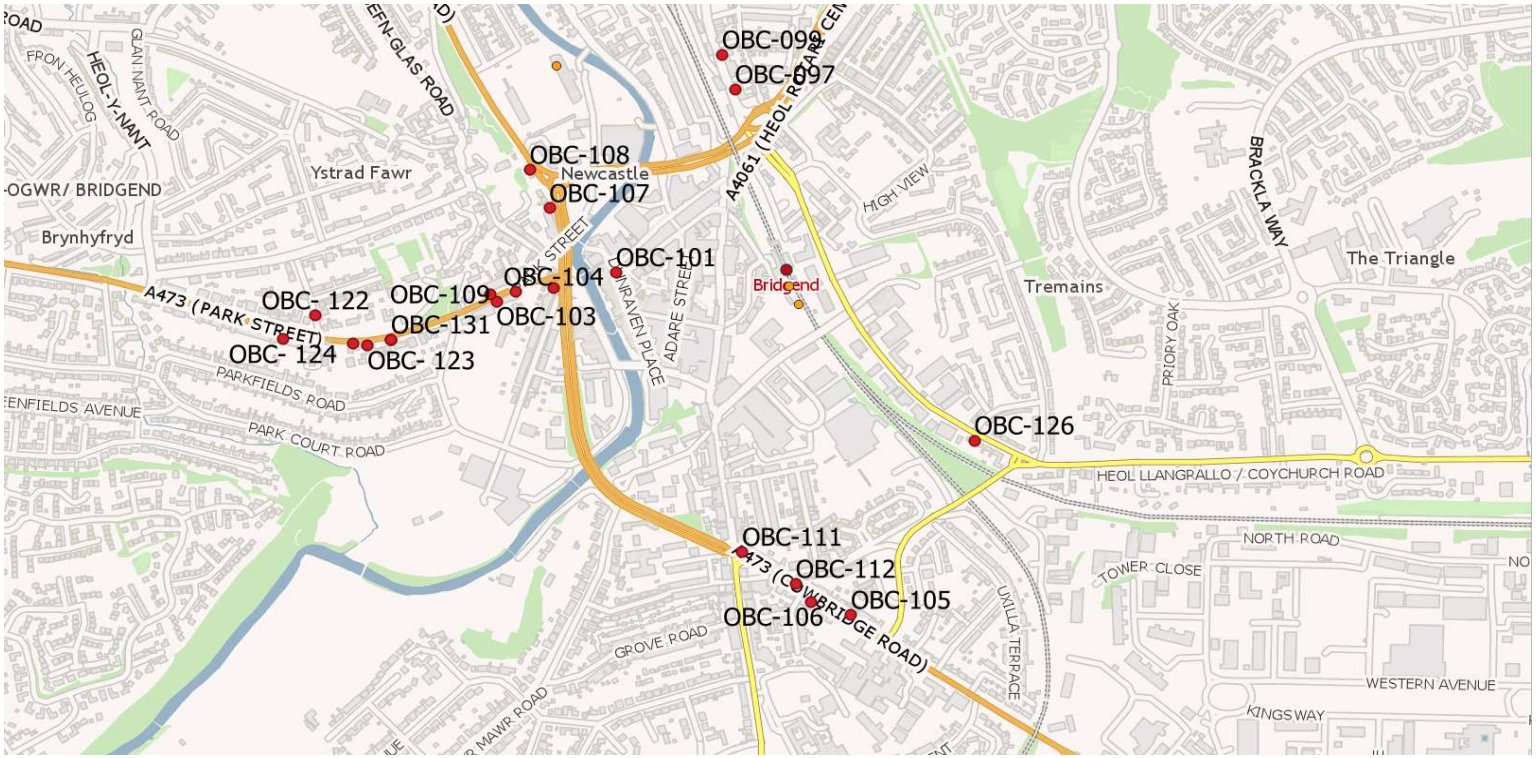
PENCOED												
OBC-116	I	Hendre Road, Pencoed	Kerbside	295886	181642	2	NO_2	N	N	(Y) 0.00	0.9	Y
OBC-117	I	Hendre Road, Pencoed	Roadside	295641	181687	2	NO_2	N	N	(Y) 0.00	8.4	Y
OBC-129	I	Wern Fawr (Near Rockwool)	Urban Background	296439	184111	50	NO_2	N	N	(Y) 0.00	N/A	Y
OBC-133	I	Coychurch Road	Roadside	295899	181363	2	NO_2	N	N	(Y) 0.00	2	Y
TREMAINS ROAD												
OBC-126	J	Tremains Road	Roadside	291125	179517	2	NO_2	N	N	(Y) 0.00	8.2	Y
COYCHURCH ROAD, BRACKLA												
OBC-127	K	Coychurch Road	Roadside	292236	179473	2	NO_2	N	N	(Y) 0.00	2	Y
A4061 / BLACKMILL ROAD												
OBC-130	L	Opposite Mason Arms	Roadside	291386	184168	2	NO_2	N	N	(Y) 0.00	2	Y
OBC-132	L	Meadow View	Roadside	293418	186662	2	NO_2	N	N	(Y) 0.00	2	Y

Notes:

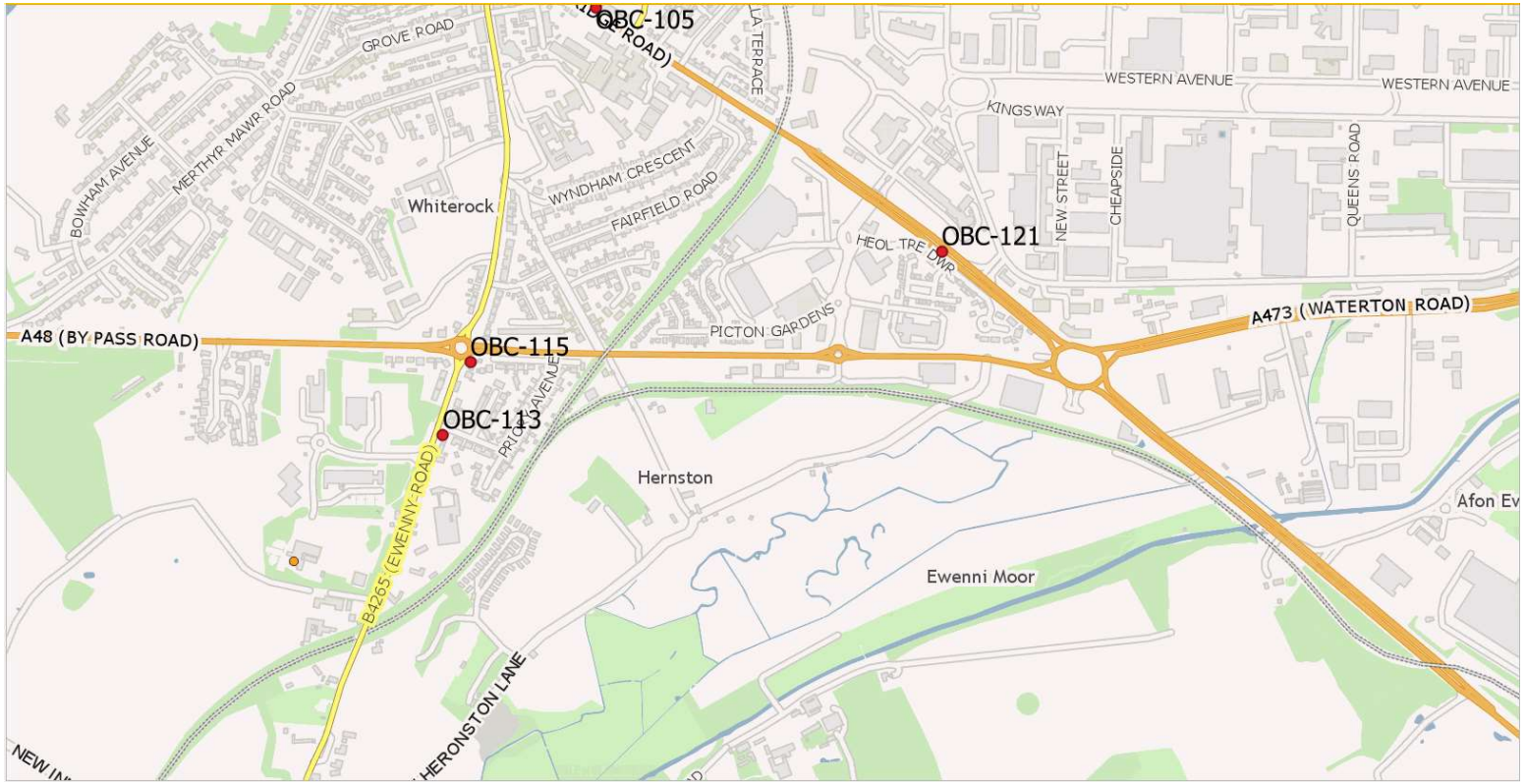
(1) 0m indicates that the sited monitor represents exposure and as such no distance calculation is required.

Figure 10 - Map of Non-Automatic Monitoring Sites in Bridgend

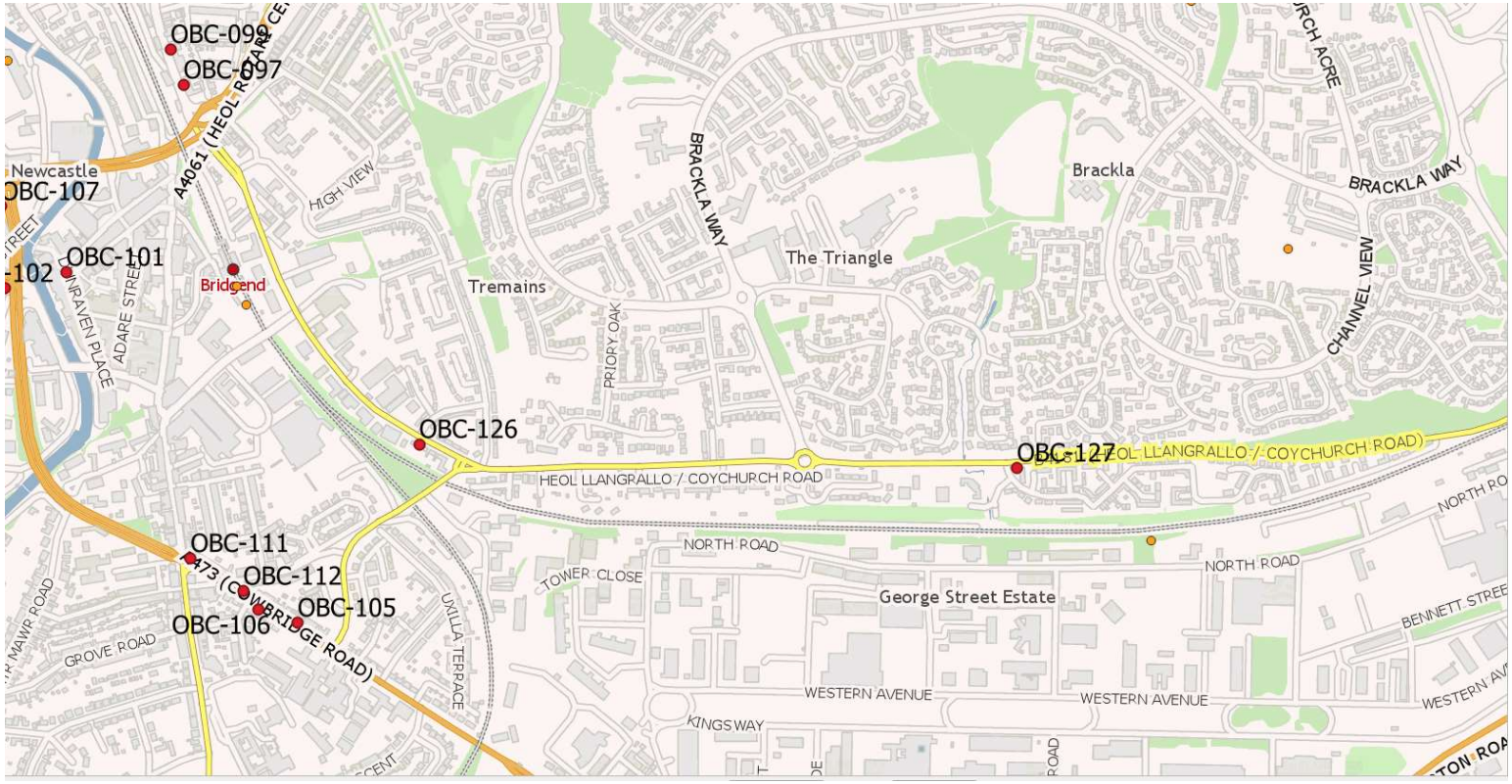
Park Street AQMA / Bridgend Town Centre / Coity Road / Cowbridge Road



Ewenny Cross Roundabout A48 / A473 Cowbridge Road



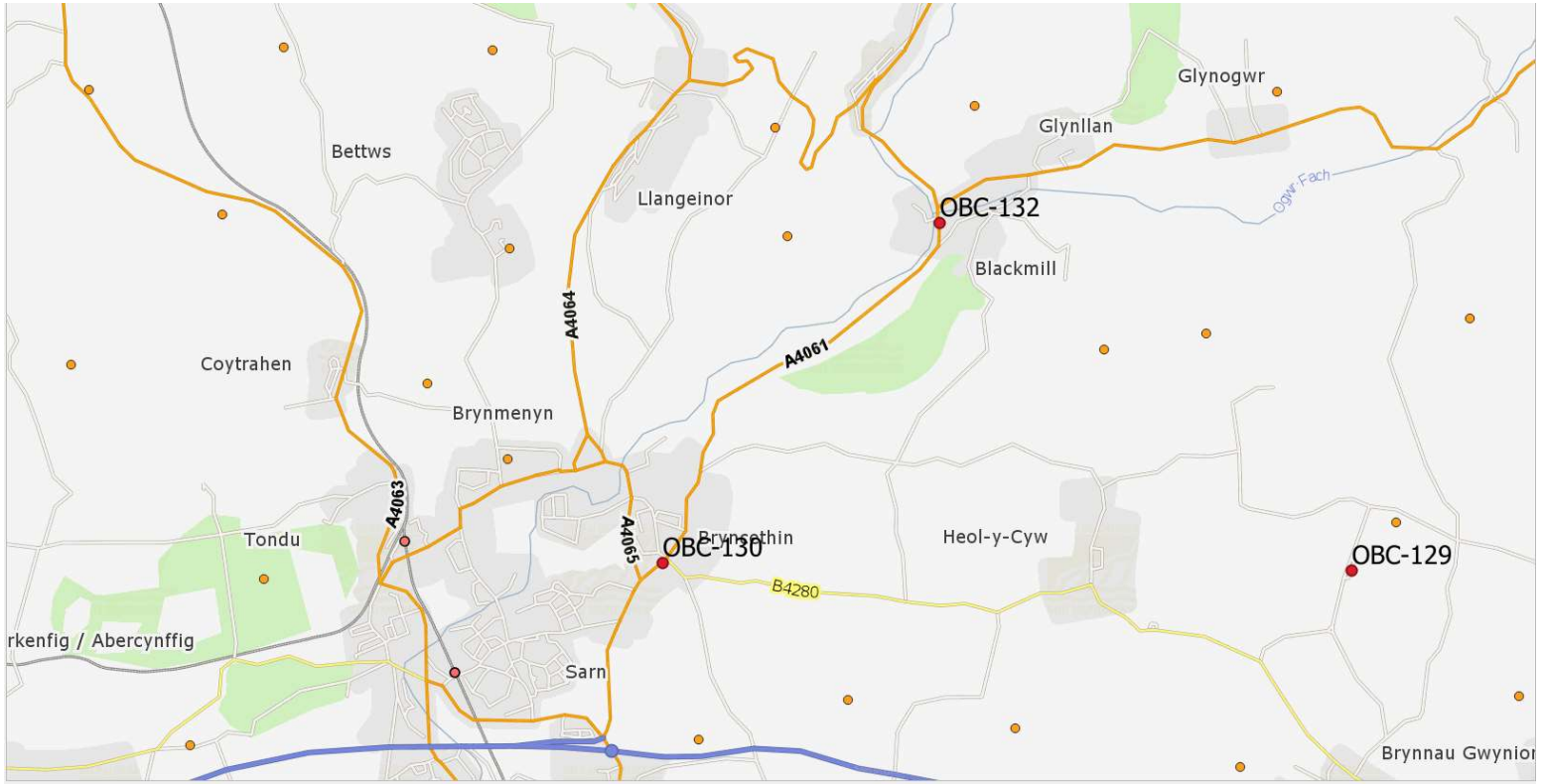
Tremains Road / Brackla



Maesteg


Maesteg
OBC-125
MAESTEG
Maesteg Ewenny Road
Y Parc
Afon Llynfi
Garth
Garth Hill
Moel Cynhordy
OBC-128
Cwmfelin
Moel Troed-y-rhiw

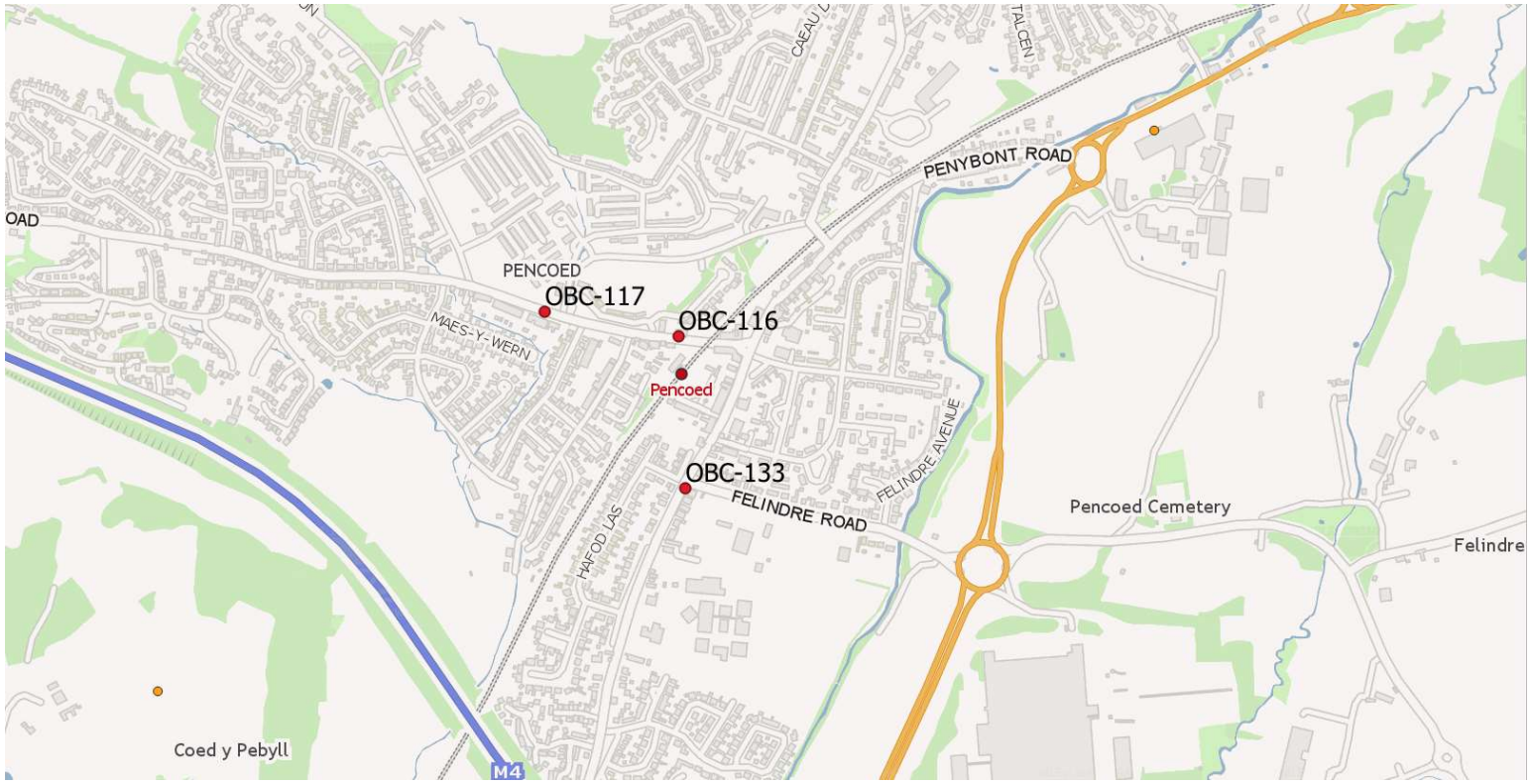
Blackmill Road / A4061



Porthcawl


Barn Yard
WEST END AVENUE
SOUTH ROAD
A4106 (NEWTON NOTTAGE ROAD)
A4106 (BRIDGEND RO
LAKEVIEW CLOSE
HEOL-Y-GOEDWIG
MEADOW LANE
HOOKLAND ROAD
WOODLAND AVENUE
Clevis
Trafalgar Wood
SEVERN ROAD
NEW ROAD
ST JOHN'S DRIVE
OBC-120
BEACH ROAD
PARK AVENUE
VICTORIA AVENUE
THE GREEN AVENUE
PORTHCAWL
Newton Burrows
JOHN STREET
WEST DRIVE
BEACH ROAD

Pencoed


PENYBONT ROAD
PENCOED
OBC-117
OBC-116
MAES-Y-WERN
Pencoed
OBC-133
FELINDRE ROAD
FELINDRE AVENUE
HAFOD LAS
Pencoed Cemetery
Felindre
Coed y Pebyll
M4

Wern Fawr near Pencoed

2.2 2021 Air Quality Monitoring Results

2.2.1 Annual NO_2 Monitoring results

Table 7 - Annual Mean NO_2 Concentration Park Street Automatic Monitor

Site ID	Site Type	Within AQMA?	Valid Data Capture 2021 % (2)	Annual Mean Concentration (µg/m^3)
				2021
Park Street Automatic Monitor	Roadside	Y	97	27

Table 8 - Annual Mean NO_2 Non-Automatic Sites

Site ID	Site Type	Monitoring Type	Valid Data Capture 2021 (%) [1]	Within AQMA?	Annual Mean Concentration (µg/m³) [2]						
					2015 (Bias Adjustment Factor = 0.81)	2016 (Bias Adjustment Factor = 0.78)	2017 (Bias Adjustment Factor = 0.77)	2018 (Bias Adjustment Factor = 0.76)	2019 (Bias Adjustment Factor = 0.75)	2020 (Bias Adjustment Factor = 0.76)	2021 (Bias Adjustment Factor = 0.78)
A473 COWBRIDGE ROAD											
OBC-105	Roadside	Diffusion Tube	100	N	-	-	24.6	22.6	21.2	16.1	19.2
OBC-106	Kerbside	Diffusion Tube	100	N	-	-	30.4/ 25.2[2 & 3]	26.7[2 & 3]	24[3]	25.8	26.1
OBC-111	Roadside	Diffusion Tube	100	N	-	-	-	26.2	25.8	19.7	22.4
OBC-112	Kerbside	Diffusion Tube	92	N	-	-	-	32.1[2]	36.2[2]	23.7[2]	29.2
OBC-121	Roadside	Diffusion Tube	100	N	-	-	-	-	18.5	14.9	15.8

Site ID	Site Type	Monitoring Type	Valid Data Capture 2021 (%) [1]	Within AQMA?	Annual Mean Concentration (µg/m^3) [2]						
					2015 (Bias Adjustment Factor = 0.81)	2016 (Bias Adjustment Factor = 0.78)	2017 (Bias Adjustment Factor = 0.77)	2018 (Bias Adjustment Factor = 0.76)	2019 (Bias Adjustment Factor = 0.75)	2020 (Bias Adjustment Factor = 0.76)	2021 (Bias Adjustment Factor = 0.78)
EWENNY CROSS ROUNDABOUT											
OBC-113	Roadside	Diffusion Tube	100	N	-	-	-	15.9	14.7	12.2	13.8
OBC-115	Roadside	Diffusion Tube	100	N	-	-	-	22.3	20.9	16.3	18.5

Site ID	Site Type	Monitoring Type	Valid Data Capture 2021 (%) [1]	Within AQMA?	Annual Mean Concentration (µg/m^3) [2]						
					2015 (Bias Adjustment Factor = 0.81)	2016 (Bias Adjustment Factor = 0.78)	2017 (Bias Adjustment Factor = 0.77)	2018 (Bias Adjustment Factor = 0.76)	2019 (Bias Adjustment Factor = 0.75)	2020 (Bias Adjustment Factor = 0.76)	2021 (Bias Adjustment Factor = 0.78)
BRIDGEND TOWN CENTRE											

OBC-101	Urban Centre	Diffusion Tube	83	N	-	-	18.1[2]	17.9	18.6	13.6[2]	15.3

Site ID	Site Type	Monitoring Type	Valid Data Capture 2021 (%) [1]	Within AQMA?	Annual Mean Concentration (µg/m^3) [2]						
					2015 (Bias Adjustment Factor = 0.81)	2016 (Bias Adjustment Factor = 0.78)	2017 (Bias Adjustment Factor = 0.77)	2018 (Bias Adjustment Factor = 0.76)	2019 (Bias Adjustment Factor = 0.75)	2020 (Bias Adjustment Factor = 0.76)	2021 (Bias Adjustment Factor = 0.78)
PARK STREET											
OBC-102	Roadside	Diffusion Tube	100	N	-	-	23.7	23.5	23.9	18.3	20.6
OBC-103	Roadside	Diffusion Tube	100	Y	-	-	37.6	36.3[2]	37.1	30.4	31.9
OBC-104	Roadside	Diffusion Tube	100	Y	-	-	41.5	37.9[2]	39.8	29.8[2]	33.6
OBC-109	Roadside	Diffusion Tube	100	Y	-	-	-	20.6	19.9	20.1[2]	19.8
OBC-110	Kerbside	Diffusion Tube	100	Y	-	-	-	58.9[2]	53.7	43.6	46.3
OBC-122	Kerbside	Diffusion Tube	75	Y	-	-	-	-	16.7	15.2	15.8
OBC-123	Roadside	Diffusion Tube	100	Y	-	-	-	-	55.2	42.4	46.5

OBC-124	Roadside	Diffusion Tube	92	N	-	-	-	-	16.6	12.9	14.1
OBC-131	Roadside	Diffusion Tube	92	Y	-	-	-	-	-	-	28.3
OBC-131	Roadside	Diffusion Tube	100	Y	-	-	-	-	-	-	28.3
OBC-131	Roadside	Diffusion Tube	100	Y	-	-	-	-	-	-	28.3

Site ID	Site Type	Monitoring Type	Valid Data Capture 2021 (%) [1]	Within AQMA?	Annual Mean Concentration (µg/m^3) [2]						
					2015 (Bias Adjustment Factor = 0.81)	2016 (Bias Adjustment Factor = 0.78)	2017 (Bias Adjustment Factor = 0.77)	2018 (Bias Adjustment Factor = 0.76)	2019 (Bias Adjustment Factor = 0.75)	2020 (Bias Adjustment Factor = 0.76)	2021 (Bias Adjustment Factor = 0.78)
TONDU ROAD ROUNDABOUT											
OBC-107	Roadside	Diffusion Tube	100	N	-	-	-	31.7	32	24.3	27.7
OBC-108	Kerbside	Diffusion Tube	100	N	-	-	-	38.5	36.2	27.5	31.7

Site ID	Site Type	Monitoring Type	Valid Data Capture 2021 (%) [1]	Within AQMA?	Annual Mean Concentration (µg/m^3) [2]						
					2015 (Bias Adjustment Factor = 0.81)	2016 (Bias Adjustment Factor = 0.78)	2017 (Bias Adjustment Factor = 0.77)	2018 (Bias Adjustment Factor = 0.76)	2019 (Bias Adjustment Factor = 0.75)	2020 (Bias Adjustment Factor = 0.76)	2021 (Bias Adjustment Factor = 0.78)
COITY ROAD											

OBC-097	Roadside	Diffusion Tube	100	N	-	-	26.3	24.6	24.8	19.5	21.4
OBC-099	Roadside	Diffusion Tube	100	N	-	-	23.8	15.1	22.2	17.9	18.1

Site ID	Site Type	Monitoring Type	Valid Data Capture 2021 (%) [1]	Within AQMA?	Annual Mean Concentration (µg/m³) [2]						
					2015 (Bias Adjustment Factor = 0.81)	2016 (Bias Adjustment Factor = 0.78)	2017 (Bias Adjustment Factor = 0.77)	2018 (Bias Adjustment Factor = 0.76)	2019 (Bias Adjustment Factor = 0.75)	2020 (Bias Adjustment Factor = 0.76)	2021 (Bias Adjustment Factor = 0.78)
MAESTEG											
OBC-125	Roadside	Diffusion Tube	92	N	-	-	-	-	18.8	19.3[2]	9.8
OBC-128	Roadside	Diffusion Tube	83	N	-	-	-	-	-	11[2]	16.8

Site ID	Site Type	Monitoring Type	Valid Data Capture 2021 (%) [1]	Within AQMA?	Annual Mean Concentration (µg/m³) [2]						
					2015 (Bias Adjustment Factor = 0.81)	2016 (Bias Adjustment Factor = 0.78)	2017 (Bias Adjustment Factor = 0.77)	2018 (Bias Adjustment Factor = 0.76)	2019 (Bias Adjustment Factor = 0.75)	2020 (Bias Adjustment Factor = 0.76)	2021 (Bias Adjustment Factor = 0.78)
PORTHCAWL											

OBC-120	Kerbside	Diffusion Tube	92	N	-	-	-	15.1	16	10.9[2]	12.6

Site ID	Site Type	Monitoring Type	Valid Data Capture 2021 (%) [1]	Within AQMA?	Annual Mean Concentration (µg/m^3) [2]						
					2015 (Bias Adjustment Factor = 0.81)	2016 (Bias Adjustment Factor = 0.78)	2017 (Bias Adjustment Factor = 0.77)	2018 (Bias Adjustment Factor = 0.76)	2019 (Bias Adjustment Factor = 0.75)	2020 (Bias Adjustment Factor = 0.76)	2021 (Bias Adjustment Factor = 0.78)
PENCOED											
OBC-116	Kerbside	Diffusion Tube	83	N	-	-	-	22.1	20.8	15.8	18.5
OBC-117	Roadside	Diffusion Tube	100	N	-	-	-	16.7	16.9	12.8	13.7
OBC-129	Urban Background	Diffusion Tube	100	N	-	-	-	-	-	9.1	7.7
OBC-133	Roadside	Diffusion Tube	50	N	-	-	-	-	-	-	17.8

Site ID	Site Type	Monitoring Type	Valid Data Capture 2021 (%) [1]	Within AQMA?	Annual Mean Concentration (µg/m^3) [2]						
					2015 (Bias Adjustment Factor = 0.81)	2016 (Bias Adjustment Factor = 0.78)	2017 (Bias Adjustment Factor = 0.77)	2018 (Bias Adjustment Factor = 0.76)	2019 (Bias Adjustment Factor = 0.75)	2020 (Bias Adjustment Factor = 0.76)	2021 (Bias Adjustment Factor = 0.78)

TREMAINS ROAD / COYCHURCH ROAD BRACKLA											
OBC-126	Roadside	Diffusion Tube	83	N	-	-	-	19.7	17.2	18.5	18.7
OBC-127	Roadside	Diffusion Tube	83	N	-	-	-	-	15.1	13.7	15.6

Site ID	Site Type	Monitoring Type	Valid Data Capture 2021 (%) (1)	Within AQMA?	Annual Mean Concentration (µg/m^3) (2)						
					2015 (Bias Adjustment Factor = 0.81)	2016 (Bias Adjustment Factor = 0.78)	2017 (Bias Adjustment Factor = 0.77)	2018 (Bias Adjustment Factor = 0.76)	2019 (Bias Adjustment Factor = 0.75)	2020 (Bias Adjustment Factor = 0.76)	2021 (Bias Adjustment Factor = 0.78)
A4061 / BLACKMILL ROAD											
OBC-130	Roadside	Diffusion Tube	83	N	-	-	-	-	-	-	31.1
OBC-132	Roadside	Diffusion Tube	83	N	-	-	-	-	-	-	25.1

Notes:

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

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

Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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%).

2.2.2 Trends in Annual Mean NO_2 Concentrations

Figure 11 shows exceedances at two monitoring points in 2021. All other locations within the AQMA are compliant with the annual NO_2 objective.

Figure 11 - Chart Showing Trends in Annual Mean NO_2 Concentrations Park Street AQMA

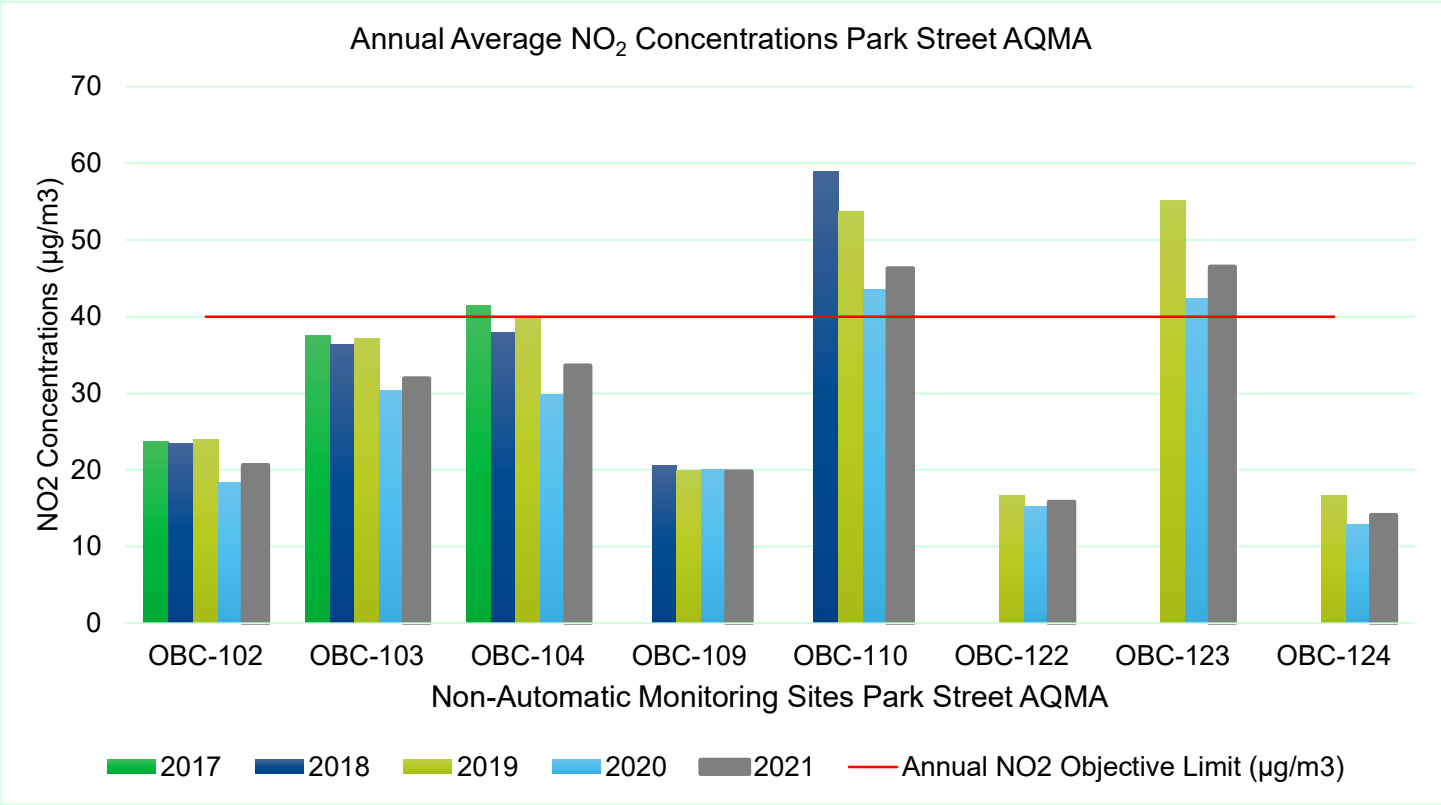


Figure 12 shows compliance with the annual NO_2 objective at both locations since 2018.

Figure 12 - Chart Showing Trends in Annual Mean NO_2 Concentrations Tondu Roundabout

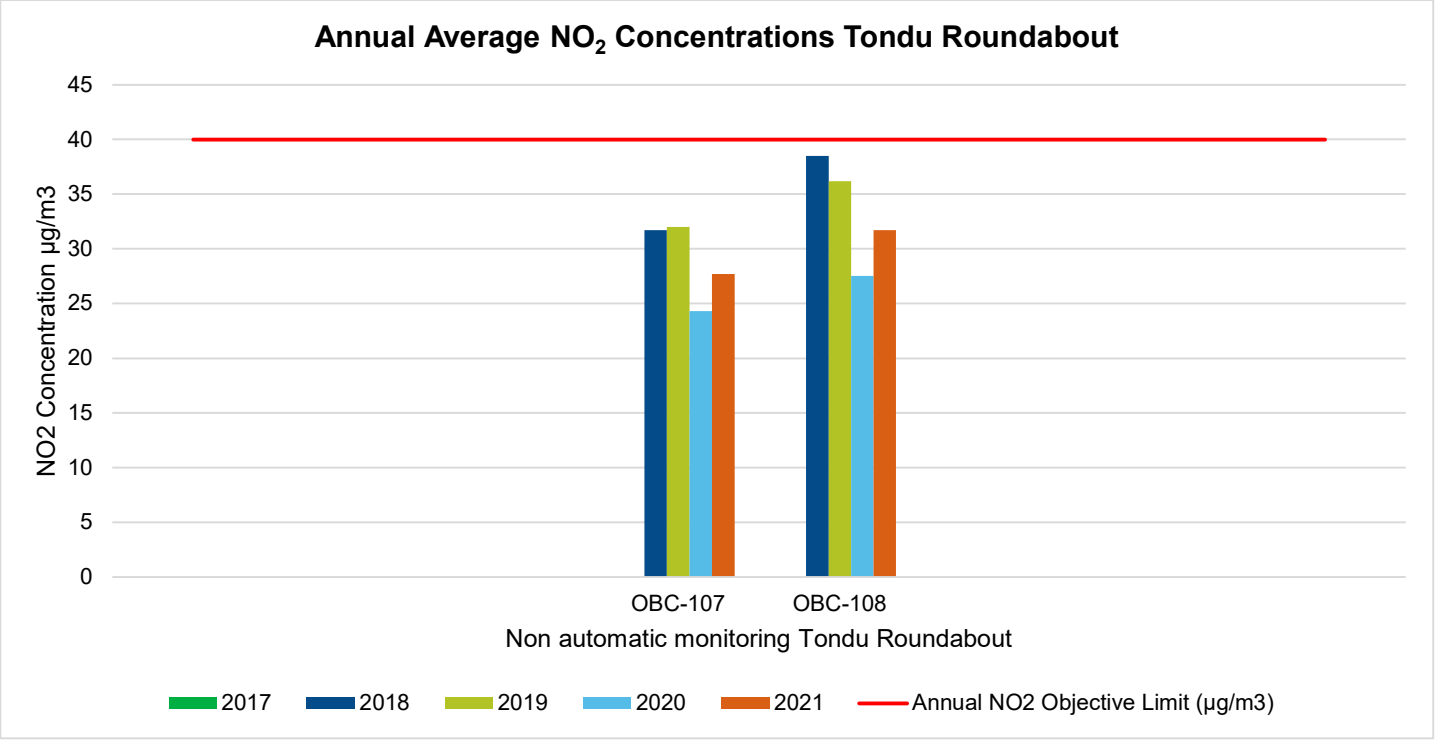


Figure 13 shows compliance with the annual NO_2 objective at all locations since 2017 . .

Figure 13 - Chart Showing Trends in Annual Mean NO_2 Concentrations A473 Cowbridge Road

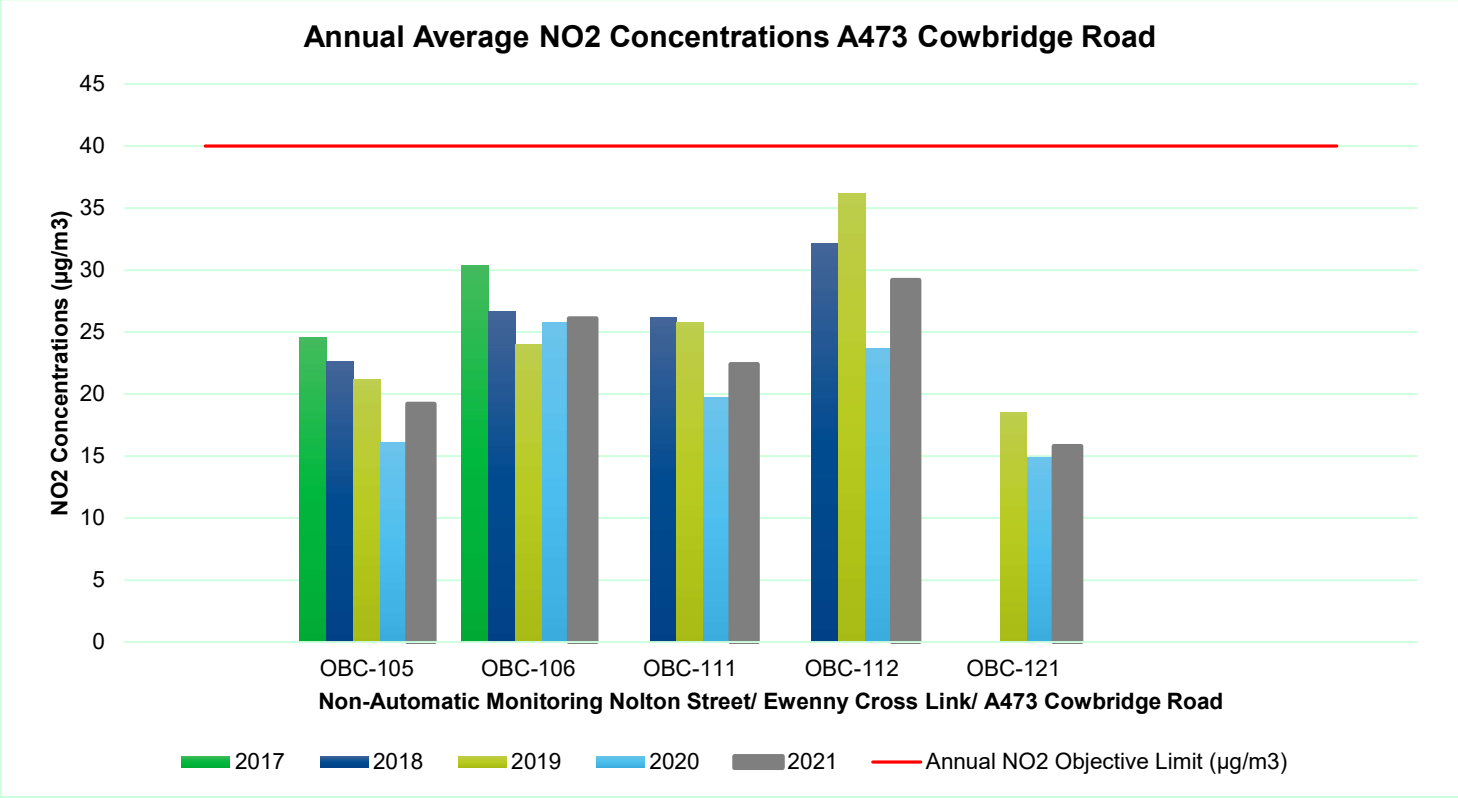


Figure 14 shows compliance with the annual NO_2 objective at all locations since 2018.

Figure 14 - Chart Showing Trends in Annual Mean NO_2 Concentrations Ewenny Cross Roundabout A48

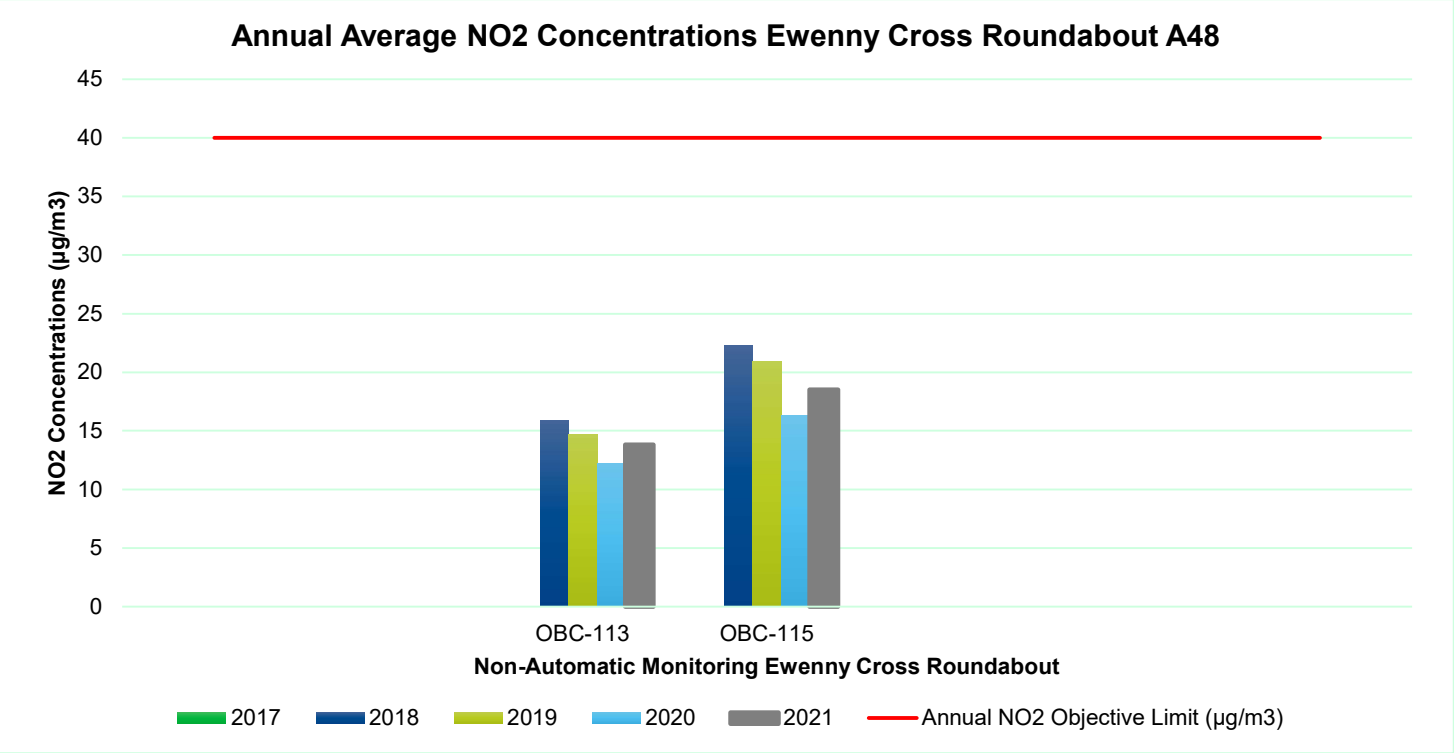


Figure 15 shows compliance with the annual NO_2 objective at all locations since 2017.

Figure 15 - Chart Showing Trends in Annual Mean NO_2 Concentrations Bridgend Town Centre/Coity Road and Brackla

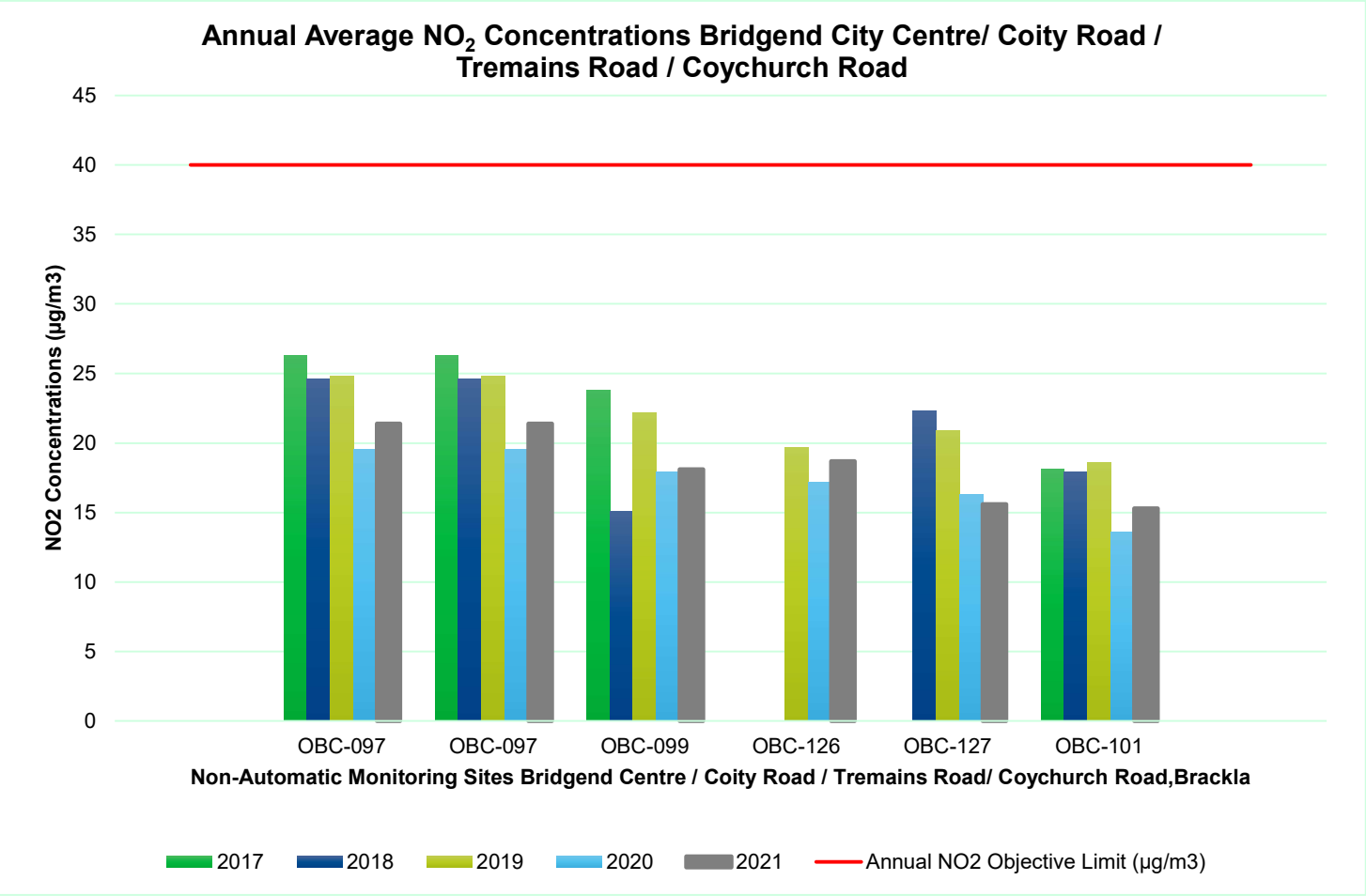


Figure 16 shows compliance with the annual NO_2 objective at both locations since 2019.

Figure 16 - Chart Showing Trends in Annual Mean NO_2 Concentrations Maesteg

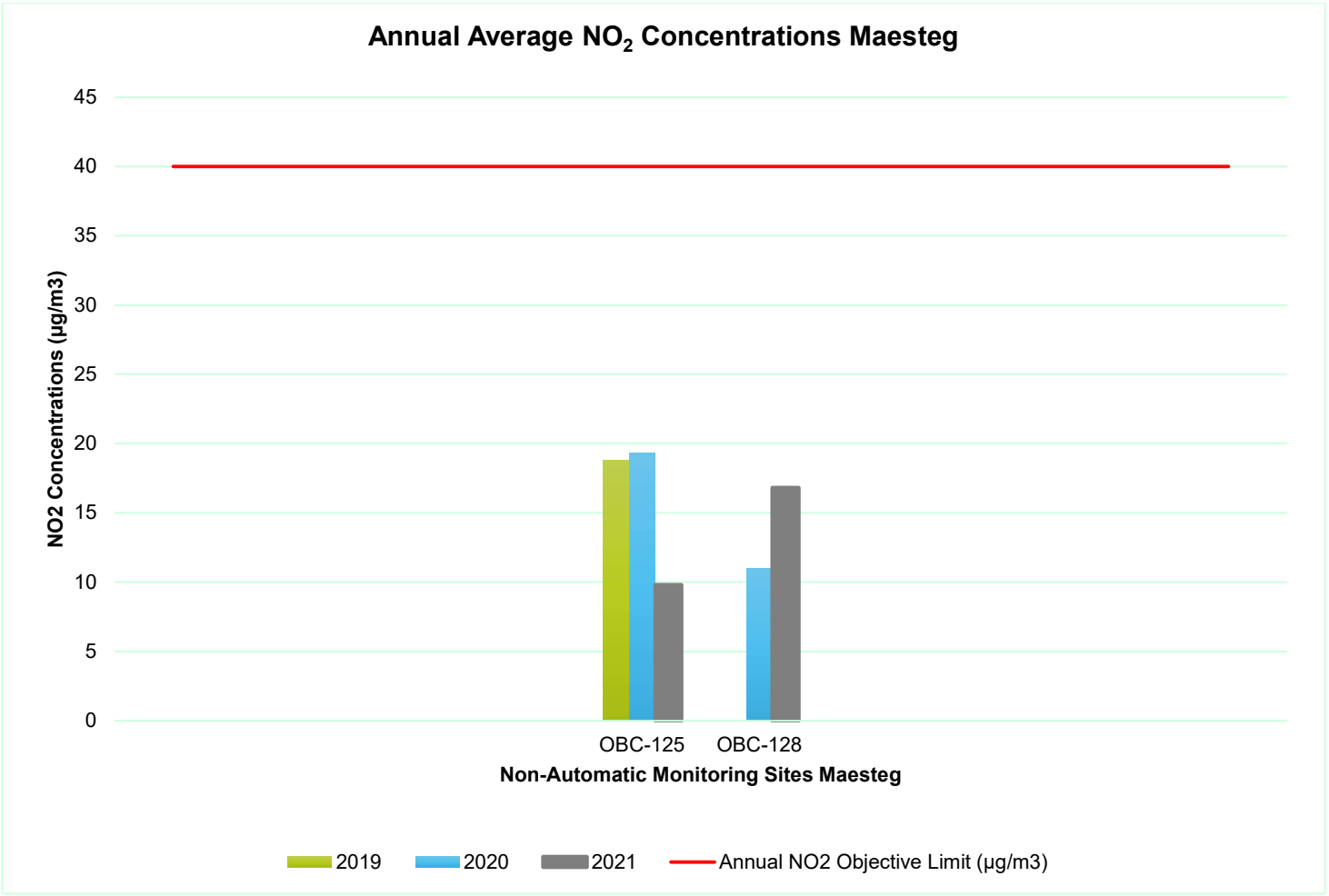


Figure 17 shows compliance with the annual NO_2 objective at all locations since 2018.

Figure 17 - Chart Showing Trends in Annual Mean NO_2 Concentrations Porthcawl

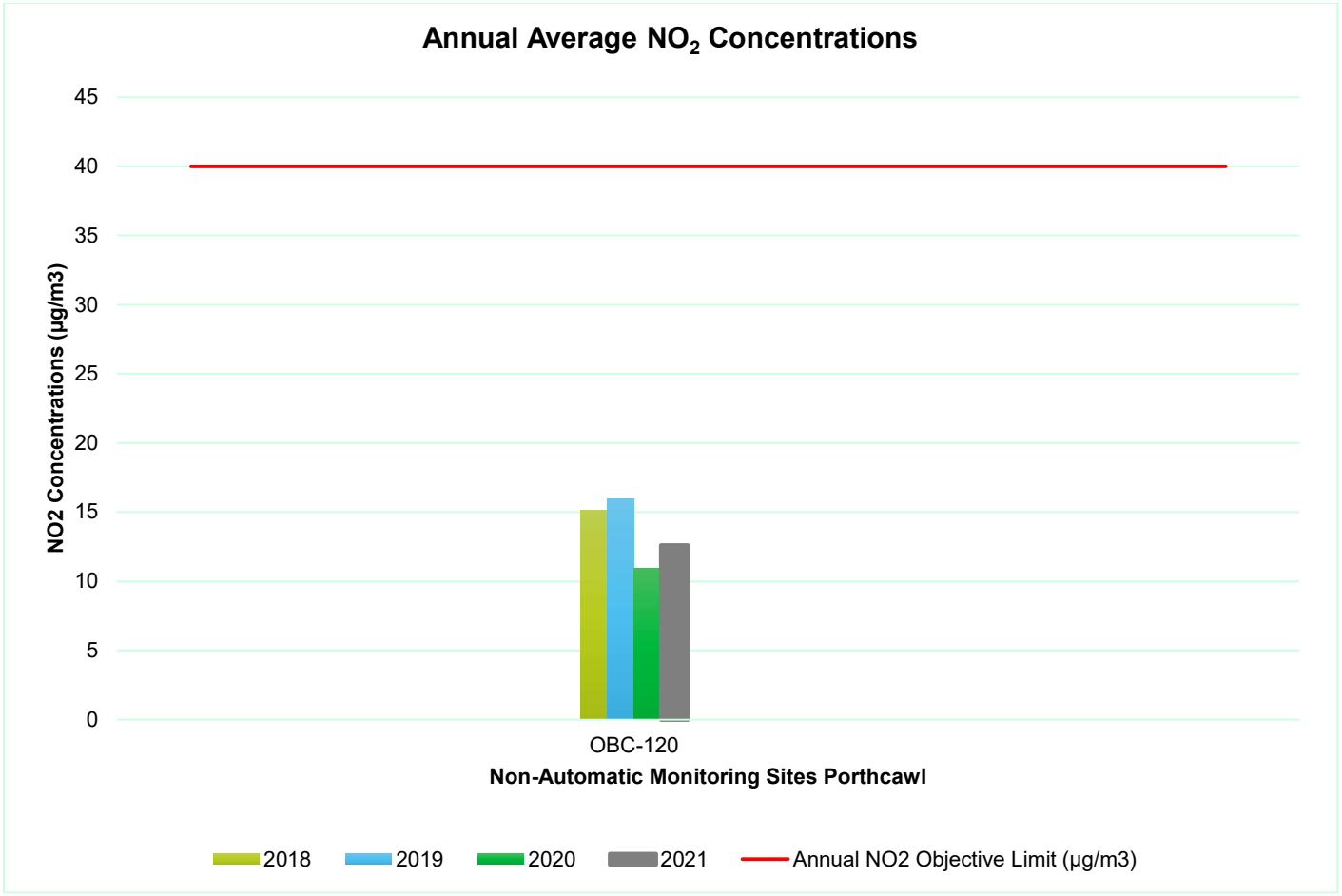
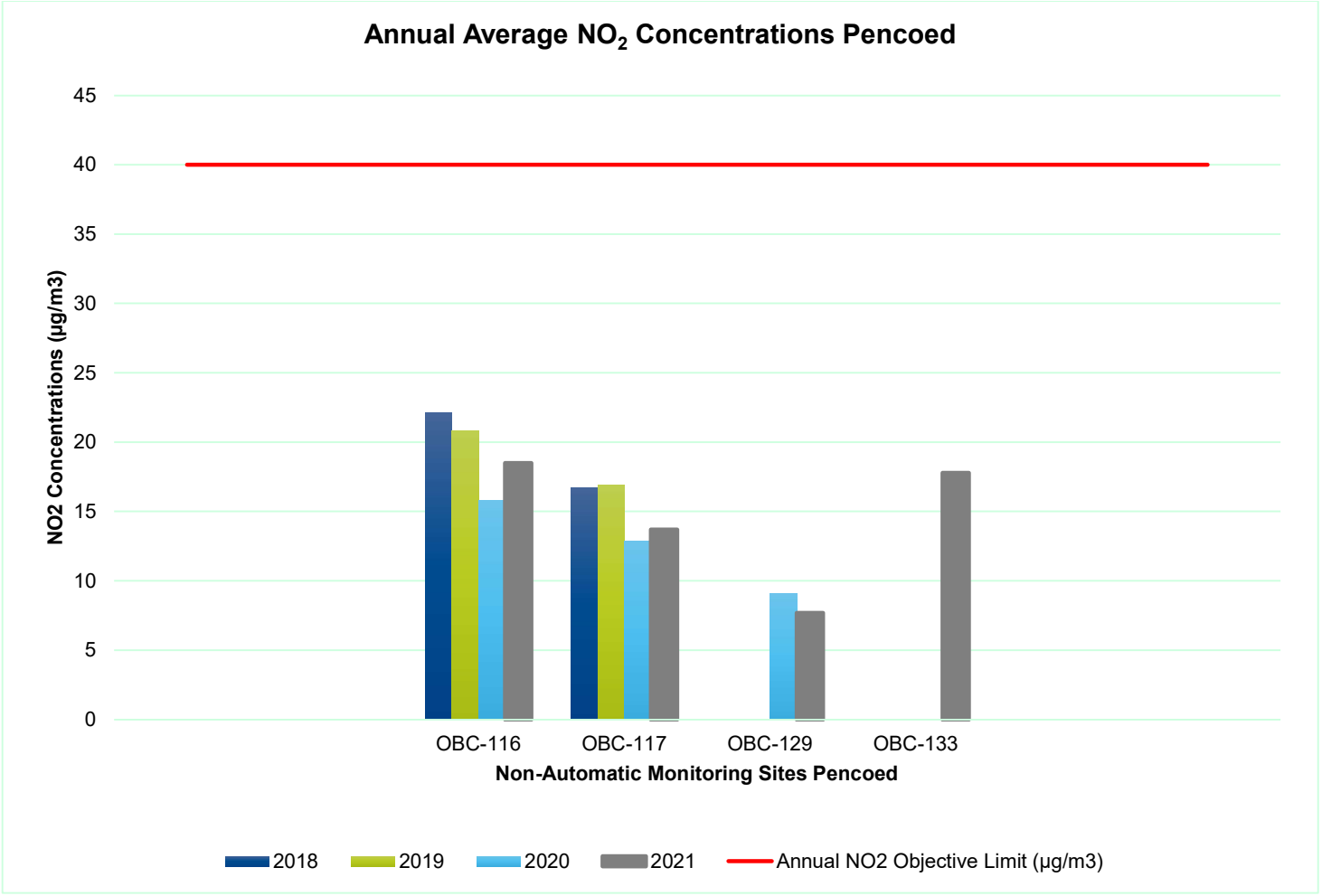


Figure 18 shows compliance with the annual NO_2 objective since 2018.

Figure 18 - Chart Showing Trends in Annual Mean NO_2 Concentrations Pencoed



2.2.3 Automated Monitoring Results

The following tables present data captured from the Automated Monitoring Station situated on Park Street.

Table 9 - 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means >200 µg/m³ .

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2022
Park Street Automatic Monitor	Roadside	Automatic	97	97	0

Notes:

Exceedances of the NO_2 1-hour mean objective (200 µg/m^3 not to be exceeded more than 18 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

(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%).

Table 10 – Annual Mean PM_{10} Monitoring Results ($\mu g/m^3$)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2021
Park Street Automatic Monitor	Roadside	88	88	17

Notes:

Exceedances of the PM_{10} annual mean objective of 40 $\mu g/m^3$ are shown in **bold**.

All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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%).

Table 11 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50 µg/m³

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2021
Park Street Automatic Monitor	Roadside	88	88	0

Notes:

Exceedances of the PM_{10} 24-hour mean objective (50 µg/m³ not to be exceeded more than 35 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

(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 2021 Monitoring Results with Previous Years and the Air Quality Objectives

During 2021, monitoring was carried out for nitrogen dioxide (NO_2) and particulate matter (PM_{10}).

2.3.1 Nitrogen Dioxide (NO_2)

Nitrogen dioxide was measured during 2021 by a network of 34 passive diffusion tubes.
To ratify the 2021 diffusion tube dataset, a bias adjustment factor of 0.78 was applied to the annual average readings. The factor was derived from the Defra website which gave the average correction factor from 23 co-location studies across the UK, whereby the analytical laboratory and method used was the same as BCBC, in this instance Socotec UK Ltd, Didcot.
Annual average datasets outline continued elevated and exceeding levels of NO_2 at sensitive receptor locations situated on Park Street within the established AQMA Order boundary. It is noted that monitoring undertaken in 2021 at sites OBC-110 & OBC-123, located on Park Street, demonstrates annual average levels in exceedance of the annual average air quality objective set at (40µg/m3) for NO_2. The annual average figure examined at sites OBC-110 & OBC-123 are calculated at **46.3 µg/m³ & 46.5 µg/m³** respectively.

The draft Air Quality Action Plan (AQAP) for Park has now been completed and the at the time of writing this report, is due to be presented for public consultation. The detailed assessment produced in conjunction with this AQAP shows an improvement in NO_2 concentrations at the locations in exceedance of the objective with implementation of the following options –

- Deny all access onto St Leonards Road (Measure 18);
- Implementation and optimisation of 4-phase junction at the Park Street/ Angel Street/ Tondu Road Junction (Measure 20).

It is essential that these monitoring in continued within the Park Street AQMA, and suitable action is taken where necessary in conjunction with the AQAP. Such action may involve amendments to the AQMA Order including revisions of the geographical boundary to encapsulate a wider area and reasoning for declaration.

Nitrogen dioxide concentrations at all other non-automatic locations were shown to be compliant the annual air quality objective for NO_2 of **40µg/m3.**

Automatic monitoring carried out by the monitor located on Park Street shows compliance with the annual air quality objective for NO_2. The annual average figure shown at this site in 2021 was **27 µg/m³** . This automatic monitor also showed no exceedances of the 1-hour NO_2 objective of **200 µg/m³** not to be exceeded more than 18 times annually.

2.3.2 Particulate Matter (PM_{10})

Particulate matter (PM_{10}) monitoring was carried out by the automatic monitoring station located in Park Street AQMA. The annual average figure shown at this site in 2021 was **17 µg/m³** which is compliant with the PM_{10} annual average objective of **40 µg/m³ .** There were also no exceedances of the 24-hour PM_{10} objective of **50 µg/m³** not to be exceeded more than 35 times annually.

2.4 Summary of Compliance with AQS Objectives as of 2021

SRS on behalf of BCBC has examined the results from monitoring in the Bridgend.

Concentrations within the Park Street AQMA still exceed the annual objective for nitrogen dioxide. Therefore, this AQMA should remain.

Despite the examined non-compliant annual average NO_2 levels recorded within the Park Street, Bridgend AQMA (OBC-110 & OBC-123), all automated and non- automated datasets show compliance with the air quality objectives at **every other monitored location.**

3 New Local Developments

SRS on behalf of BCBC can confirm that there are no new significant developments since the Progress Report in 2021.

3.1 Road Traffic Sources (and Other Transport)

SRS on behalf of BCBC can confirm that there are no new significant road traffic sources since the 2020 Annual Progress Report in 2021.

3.2 Industrial / Fugitive or Uncontrolled Sources / Commercial Sources

P/21/173/ESO - Llynfi Biomass Plant, Llangynwyd

A scoping opinion was received for an Energy Recovery Facility and ancillary infrastructure for Llynfi Biomass Plant, Llangynwyd. The applicant provided a methodology for an air quality assessment which was agreed with air quality officers. There has been no further progress made with this application.

3.3 Other Sources

SRS on behalf of BCBC confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

SRS on behalf of BCBC confirms that all the following have been considered:

1. Road traffic sources
2. Other transport sources
3. Industrial sources
4. Commercial and domestic sources
5. New developments with fugitive or uncontrolled sources.

4 Policies and Strategies Affecting Airborne Pollution

Local Development Plan (LDP) 2006- 2021. The document provides a framework for sustainable development within the County Borough of Bridgend, outlining strategies and policies for future land use and development. One of the main strategic LDP objectives is highlighted in Strategic Policy 4 (SP4) which promotes the conservation and enhancement of the natural environment. SP4 illustrates that development proposals will not be permitted where they have an adverse impact upon the quality of natural resources, including water air and soil.

Also highlighted within the LDP document is Policy ENV 7 (Natural Resource Protection and Public Health). “Development proposals will only be permitted where it can be demonstrated that they would not cause a new, or exacerbate an existing, unacceptable risk of harm to health, biodiversity and/or local amenity due to air pollution” Where proposed developments indicate negative impacts, measures and mitigation methods must be detailed to enable impacts to be minimised to an acceptable level. For example, in terms of air quality, measures can include the production of an Air Quality Assessment and the implementation of conditions. The LDP documentation for Bridgend County Council is available at http://www1.bridgend.gov.uk/media/174812/ldp_text.pdf

The LDP document has been under review since 2018. SRS are feeding into this document where necessary to outline air quality as an influential consideration and ensure its importance within the decision-making process. Refer to the following link for useful questions and answers regarding the new plan’s development. https://www.bridgend.gov.uk/news/the-replacement-local-development-plan-explained

4.1 Local Transport Plans and Strategies

The Local Transport Plan (LTP) 2015- 2030. The Welsh Government now requires local authorities in Wales to prepare and adopt Local Transport Plan (LTPs) as the framework for identifying local transport schemes for improvements. LTPs therefore replace Regional Transport Plans.

Under guidance from the Welsh Government, local authorities have the choice to develop and adopt either joint LTPs with neighbouring local authorities or a stand-alone LTP for their own geographical area.

Bridgend County Borough Council has opted for the latter approach in view of the uncertainty of the future of local authority boundaries and structures amid discussions of reorganisation of local government.

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. “The Council is mindful of the broader negative impact of transport related emissions on health and the natural environment” “To reduce the environmental impact of transport, the LTP includes measures and interventions that will increase opportunities for active travel, encourage the use of public transport and promote modal integration.”

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. Bridgend County Borough Council LAQM Annual Progress Report 2021 69 The LTP policy is available at http://www1.bridgend.gov.uk/media/352797/bridgend-ltp-wg-approved-version-may-2015.pdf

4.2 Active Travel Plans and Strategies

In September 2014, the Welsh Government introduced the Active Travel (Wales) Act. This measure legally requires Welsh local authorities to map and plan suitable routes for Active Travel within certain areas, as designated by the Welsh Government.

Following formal public consultation and review by Welsh Government, BCBC has produced Integrated Network Maps (INM) that show highlighted routes dedicated to pedestrians and cyclists. The maps are available to download from; https://www.bridgend.gov.uk/residents/roads-transport-and-parking/active-travel-routes/

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 5 there are seven national well-being goals that form the basis of the Act and five ways of working which support the goals.

Public, third and business sectors have come together in Bridgend to form a Public Services Board (PSB). Bridgend PSB is committed to working together to improve wellbeing in Bridgend County Borough now and in the future. Bridgend PSB has used the sustainable development principle and the new five ways of working to develop a Well-Being Plan (2018-2023).

The plan outlines the things that Bridgend PSB will work together on, over the next five years, well-being objectives and steps, and provide a vision for how Bridgend will look in 10 years' time. The plan is seen as a mechanism that provides the best possible means of working to help understand the underlying causes of problems and prevent those problems getting worse or happening in the future.

Contributing to the seven national well-being goals and long-term vision for Bridgend, Bridgend PSB has developed four main objectives.

Figure 19- Bridgend PSB Four Well-being Objectives

In accordance with air quality, as part of the objective for "Healthy Choices in a Healthy Environment" Bridgend PSB outlines that resources are best utilised and collaborative working ensures that the built, cultural and natural environment remains resilient in future. The priority areas to endorse and encourage the success of the objective will include working together to maximise benefit from cultural, built and natural assets. It will also look at promoting a more resource and energy efficient way of living and working. In order to measure the success of promoting a more resource and energy way of living air quality, particularly NO2 levels will be examined.

Bridgend PSB Well-being Plan is available at.

https://www.bridgend.gov.uk/media/3657/bridgend-wellbeing-bps-plan-e-0518.pdf

4.4 Green Infrastructure Plans and Strategies

Outlined in Bridgend's Local Development Plan (LDP) 2006- 2021, Policy ENV5 focuses upon Green infrastructure.

Policy ENV5

Green Infrastructure

Green infrastructure will be provided through the protection and enhancement of existing natural assets and the creation of new multi-functional areas of green space. Green infrastructure corridors will connect locations of natural heritage, green space, biodiversity or other environmental interest. They will be safeguarded through:

1) Not permitting development that compromises their integrity and therefore that of the overall green infrastructure framework;

2) Using developer contributions to facilitate improvements to their quality and robustness;

3) Investing in appropriate management, enhancement and restoration, and the creation of new resources.

A Supplementary Planning Guidance (SPG) concerning Green Infrastructure was produced in 2014 by BCBC to provide a detailed understanding to the elements raised in the LDP.

-The document highlights how the Council expect habitats to be considered as part of development proposals within the County Borough of Bridgend. It also introduces the concept of adopting a *Green Infrastructure Approach* to development.

In addition to the above, outlined within the Bridgend PSB Well-being Plan, as part of the objective "Healthy Choices in a Healthy Environment" and priority area to include working together to maximise benefit from cultural, built and natural assets, the steps involved will;

- identify opportunities to improve the green asset base by implementing the Bridgend Nature Recovery Plan.

- improve the public estate and green spaces in urban areas by encouraging award of green flag status.

4.5 Climate Change Strategies

4.5.1 Bridgend 2030 Strategy

Bridgend County Borough Council declared its own climate emergency in June 2020 and set up a Climate Emergency Response programme to commit to the Net Zero 2030 target as an organisation.

The Bridgend 2030 Net Zero Carbon Strategy, or 'Bridgend 2030 Strategy' is the initial strategic step in achieving this commitment. The strategy will also remain an integral part of the council's Corporate Plan and Wellbeing Plan. At the time of writing this report the Bridgend 2030 Strategy is out for public consultation https://www.bridgend.gov.uk/media/14059/appendix-1-bridgend-2030-net-zero-carbon-strategy-250222.pdf .
Further details of the Final Strategy will be presented in the 2023 APR.

4.5.2 Climate Change Commitment within the LDP

Prior to the development of the 2030 Strategy the LDP ,made reference to Climate Change in Policy PLA4 . This stated all development proposals will be required to make a positive contribution towards tackling the causes of, and adapting to the impacts of Climate Change and Peak Oil issues. Means of achieving this may include:

- Having lower carbon energy requirements by reducing energy demand, and promoting energy efficiency;
- Utilising local materials and supplies wherever feasible;
- Encouraging the development of renewable energy generation;
- Having a location and layout which reflects sustainable transport and access principles, thereby reducing the overall need to travel;
- Having a design, layout and landscaping which:
  (i) helps wildlife and habitats to adapt to the changing climate;

(ii) assists cooling of the urban environment, including the use of passive building techniques where appropriate;

- Using resources more efficiently and minimising wastewater use and pollution;
  Avoiding or minimising the risk from flooding and/ or adapting to the increased risk of flooding, coastal erosion and warmer annual mean temperatures; and
- Promoting sustainable building methods and drainage systems where appropriate.

5 Conclusion and Proposed Actions

5.1 Conclusions from New Monitoring Data

Annual average datasets outline continued elevated and exceeding levels of NO_2 at sensitive receptor locations situated on Park Street within the established AQMA Order boundary. It is noted that monitoring undertaken in 2021 at sites OBC-110 & OBC-123, located on Park Street at residential facades exceed the annual average air quality objective set at (40µg/m3) for NO_2. All automated and non- automated datasets show compliance with the air quality objectives at **every other monitored location.**

5.2 Other Conclusions

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

5.3 Proposed Actions

SRS/ BCBC are working in accordance with WG's Policy Guidance to finalise an Air Quality Action Plan (AQAP) for Park Street AQMA. The draft AQAP is due for public consultation in the summer of 2022 and will be finalised following the consultation process.

References

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2. Welsh Government, Local Air Quality Management in Wales, Policy Guidance, June 2017.
3. Clean Air Advisory Panel report - Impact of the Covid-19 pandemic on air quality in Wales https://airquality.gov.wales/sites/default/files/documents/2021-01/Clean_Air_Advisory_Panel_report-Impacts_of_the_Covid-19_pandemic_on_air_quality_in_Wales_English.pdf
4. Provisional Analysis of Welsh Air Quality Monitoring Data – Impacts of Covid-19 https://airquality.gov.wales/sites/default/files/documents/2020-08/Analysis_of_Welsh_Air_Quality_Data_Impacts_of_Covid-19_Final_Issue2.pdf
5. Provisional Analysis of Welsh Air Quality Monitoring Data – Impacts of Covid-19, Public Health Wales Opinion https://airquality.gov.wales/sites/default/files/documents/2020-08/Covid_and_air_quality-a_public_health_opinion_final_English.pdf

BRIDGEND COUNTY BOROUGH COUNCIL LAQM REPORTS

https://www.srs.wales/en/Environmental-Health/Noise-and-Air-Pollution/Air-quality-and-pollution/Air-Quality-and-Pollution.aspx

-First Stage Review and Assessment of Air Quality in Bridgend County Borough, September 1999

-Second Stage Review and Assessment of Air Quality in Bridgend County Borough, December 2000

-Updating and Screening Assessment of Air Quality in Bridgend County Borough, July 2003

-Local Air Quality Management Progress Report, July 2005

-Detailed Assessment of Nitrogen Dioxide and Particles (PM_{10}), March 2006

-Updating and Screening Assessment of Air Quality in Bridgend County Borough, May 2006

-Local Air Quality Management Progress Report, August 2007

-Local Air Quality Management Progress Report, August 2008

-Updating and Screening Assessment of Air Quality in Bridgend County Borough, June 2009

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-Local Air Quality Management Progress Report, August 2017

-Local Air Quality Management Progress Report, August 2018

-Local Air Quality Management Progress Report, August 2019

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: AQMA Boundary Maps

Appendix A: Quality Assurance / Quality Control (QA/QC) Data

Table 12 - Full Monthly Diffusion Tube Results for 2021 (µg/m^3)

Site No	Nitrogen Dioxide Sites, Bridgend CBC	Class		07/01/2021 - 05/02/2021	05/02/2021-05/03/2021	05/03/2021 - 30/03/2021	30/03/2021/06/05/2021	06/05/2021 - 02/06/2021	02/06/2021 - 30/06/2021	30/06/2021 - 05/08/2021	05/08/2021 - 31/08/2021	31/08/2021-30/09/2021	30/09/2021 - 01/11/2021	01/11/2021 - 30/11/2021	30/11/2021-06/01/2021	AVERAGE SINCE JAN 21	Bias Corrected (Correction Factor 0.78)
TONDU ROAD ROUNDABOUT																	
OBC-107	17 Tondu Road, Bridgend	Roadside		39.40	34.1	37.5	33.3	30.8	24.4	30.0	31.3	37.3	39.1	47.1	42.3	35.6	**27.7**
OBC-108	43 Tondu Road , Bridgend	Kerbside		45.4	36.7	46.3	38.4	39.8	30.9	36.6	32.8	42.1	44.4	49.3	45.2	40.7	**31.7**
PARK STREET																	
OBC-102	4 Sunnyside	Roadside		30.2	30.7	27.2	29.4	22.0	19.7	17.7	22.4	27.8	23.6	34.6	31.1	26.4	**20.6**
OBC-103	39 Park Street	Kerbside		48.7	42.8	45.7	33.9	31.1	38.2	37.4	34.9	39.7	44.8	45.3	47.5	40.8	**31.9**
OBC-104	51 Park Street	Kerbside		48.1	35.6	40.8	42	43.3	41.1	40.1	37.1	47.2	44.6	51.4	45.6	43.1	**33.6**
OBC-109	32 Park Street	Roadside		29.8	22.3	56.8	23.4	18.9	18.3	16.6	17.4	21.5	20.9	30.8	27.2	25.3	**19.8**
OBC- 122	Post on St Leonards Road	Kerbside		28.0	23.6	21.2		17.8	14.7	12.4	15.6	21.4			27.2	20.2	**15.8**
OBC- 123	93 Park Street Bridgend	Roadside		66.5	55.4	61.7	61.6	57.6	48.3	57.2	48.2	54.9	57.1	80.4	66.5	59.6	**46.5**
OBC- 124	133 Park Street	Roadside		28.0	19.6	17.8	17.1	13.1		12.1	11.1	14.3	16.5	25.5	23.7	18.1	**14.1**
OBC-110	101/103 Park Street	Kerbside		80.0	52.8	24.1	52.8	56.0	52.7	55.2	46.5	68.3	64.5	79.3	79.5	59.3	**46.3**
OBC-131	Park Street Co-Location 1	Kerbside		30.1	35.9	40.9	35.9	35.8	32.0	32.9	23.5	38.5		51.1	42.9	36.3	**28.3**
OBC-131	Park Street Co-Location 2	Kerbside		46.5	33.5	38.3	37.5	26.1	22.5	31.0	28.3	38.5	39.2	54.6	40.1	36.3	**28.3**
OBC-131	Park Street Co-location 3	Kerbside		43.4	33	37.4	35.4	35.4	29.7	30.3	31.2	35.8	37.9	51.5	34.3	36.3	**28.3**
BRIDGEND CITY CENTRE																	
OBC-101	Bridgend City Centre	Urban Centre		28.5	18.6	20.1	19	15.1	13.0	14.3		18.2	19.3	30.5		19.7	**15.3**
NOLTON STREET / EWENNY RD CROSS LINK/ A473 Cowbridge Road																	
OBC-111	01 Cowbridge Road	Roadside		39.3	29.8	28	30.3	24.2	20.3	19.8	21.0	27.0	27.0	44.7	33.8	28.8	**22.4**
OBC- 105	65 Cowbridge Road	Roadside		33.7	23.2	24.8	27.5	19.4	16.6	17.2	16.4	23.5	23.8	38.7	30.0	24.6	**19.2**
OBC- 106	38/40 Cowbridge Road	Kerbside		52.9	37.7	40.7	32.3	28.9	20.6	23.0	23.0	31.0	32.4	46.5	32.4	33.5	**26.1**
OBC- 121	29 Heol Tre Dwr	Roadside		29.5	20.5	21.8	23.5	14.5	11.4	15.1	14.3	20.2	18.6	27.7	26.0	20.3	**15.8**
OBC-112	33 Cowbridge Road	Kerbside		50.6	25.9	31.9	52.4	34.5	30.7	28.8	28.2		33.3	52.0	43.2	37.4	**29.2**
EWENNY ROUNDABOUT																	
OBC-113	127 Priory Avenue	Roadside		24.7	15.8	18.5	17.8	13.4	13.0	15.6	11.2	14.6	19.2	27.4	21.8	17.8	**13.8**
OBC-115	105 Ewenny Road	Roadside		31.5	23.1	26.3	26.4	19.2	16.0	18.4	18.3	23.5	21.7	32.7	27.4	23.7	**18.5**
MAESTEG																	
OBC-128	25 Mill Street Maesteg			16.3	15.4	13.3	12.8	10.3	10.8	9.6	**8.9**	11.8	**11.3**	**17.1**		12.5	**9.8**
OBC- 125	60 Commercial Street, Maesteg	Roadside		26.7	20.3	21		15.3	12.8	18.4		20.5	22.5	32.7	24.7	21.5	**16.8**
COITY ROAD, BRIDGEND																	
OBC-097	22 Coity Road, Bridgend	Roadside		33.9	26.8	25.5	28.7	23.9	22.5	21.6	21.7	29.6	27.60	36.90	31.2	27.5	**21.4**
OBC-099	42 Coity Road, Bridgend	Roadside		32.1	23.4	20.6	24.3	16.5	18.9	19.1	17.7	24.2	24.20	29.90	28.1	23.3	**18.1**
PENCOED																	
OBC-116	20 Hendre Road, Pencoed	Roadside		32.8	24.6	23	24.1	20.4	21.4	18.6	19.4	23.6		29.50		23.7	**18.5**
OBC-117	47 Hendre Road, Pencoed	Roadside		21	16.6	18.8	18.2	13.4	13.7	14.4	13.1	18.1	16.50	23.60	23.4	17.6	**13.7**
OBC-129	Wern Fawr (Near Rockwool)	Urban Background		14.5	10.3	12.4	8	8.0	9.3	7.7	8.4	9.1	7.4	12.3	10.7	9.8	**7.7**
OBC-133	Coychurch Road, Pencoed									19.5	18.8	24.5	24.7	34.0	29.1	25.1	**17.8**
PORTHCAWL																	
OBC-120	105 New Road. Porthcawl	Roadside		18.9	13.7	16.2		14.0	13.8	12.6	14.2	17.4	14.90	23.80	18.4	16.2	**12.6**
BRIDGEND TREMAINS ROAD / BRACKLA																	
OBC-126	Tremains Guest House,Tremains Road, Bridgend	Roadside		27.3	23.9	25.8	25.7	17.3	17.4	20.2	17.0	23.4	25.4	33.1	31.2	24.0	**18.7**
OBC-127	Coychurch Road/Longacre, Brackla	Kerbside		25	20.3	20.8	14.2	15.8	14.9	16.6	12.8	21.8	19.1	30.5	28	20.0	**15.6**
A4061 / BLACKMILL ROAD																	
OBC-130	A4061 / Opposite Mason Arms	Roadside		49.8	30.8		37.5	39.6	36.3	32.1	29.9	44		58.5	40.3	39.9	**31.1**
OBC-132	A4061 / Meadow View Signpost	Roadside		39.2	33.9	31.5	32.9	31.2	29.2	25.2	27.7	33	32.6	35.7	33.9	32.2	**25.1**

Notes:

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

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 the 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 an Air Quality Action Plan (AQAP) within 18 months of declaration setting out the measures it intends to put in place in pursuit of the objectives. Action plans should then be reviewed and updated where necessary at least every five 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 13.

The table shows the objectives in units of microgrammes per cubic metre µg/m^3 (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedances in each year that are permitted (where applicable).

Table 13 - Air Quality Objectives Included in Regulations for the Purpose of LAQM in Wales

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as	Date to be achieved by
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean	31.12.2005
Particulate Matter (PM_{10})	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean	31.12.2010
Particulate Matter (PM_{10})	40µg/m^3	Annual mean	31.12.2010
Sulphur dioxide (SO_2)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
Sulphur dioxide (SO_2)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
Sulphur dioxide (SO_2)	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	16.25µg/m^3	Running annual mean	31.12.2003
Benzene	5µg/m^3	Annual mean	31 12 2010
1,3 Butadiene	2.25µg/m^3	Running annual mean	31.12.2003
Carbon Monoxide	10.0mg/m^3	Maximum Daily 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

QA/QC of Diffusion Tube Monitoring

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 06/21) was used to obtain an overall adjustment factor of 0.78 from the input data shown in the following screenshot. This overall factor is based on 42 co-location studies where the tube preparation method and analysis laboratory used were the same as those used by SRS.

Figure 20 - National Diffusion Tube Bias Adjustment Factor Spreadsheet

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/22

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 June 2022
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[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

Analysed By[1]	Method (To select your selection, choose (All) from the pop-up list)	Year[2] (To select your selection, 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)
SOCOTEC Didcot	50% TEA in acetone	2021	UB	City of York Council	11	17	13	38.2%	G	**0.72**
SOCOTEC Didcot	50% TEA in acetone	2021	R	City of York Council	12	25	20	27.0%	G	**0.79**
SOCOTEC Didcot	50% TEA in acetone	2021	R	City of York Council	12	22	17	29.0%	G	**0.77**
SOCOTEC Didcot	50% TEA in acetone	2021	R	City of York Council	12	37	25	45.5%	G	**0.69**
SOCOTEC Didcot	50% TEA in acetone	2021	UI	North Lincolnshire Council	12	17	14	19.9%	G	**0.83**
Socotec Didcot	50% TEA in acetone	2021	R	Bridgend Borough County Council / Shared Regula	12	36	25	42.9%	G	**0.70**
Socotec Didcot	50% TEA in acetone	2021	UB	Derry City and Strabane District Council	12	11	9	28.4%	G	**0.78**
Socotec Didcot	50% TEA in acetone	2021	R	Derry City and Strabane District Council	12	30	30	2.4%	G	**0.98**
Socotec Didcot	50% TEA in acetone	2021	R	East Suffolk Council	11	30	25	22.3%	P	**0.82**
Socotec Didcot	50% TEA in acetone	2021	KS	Marylebone Road Intercomparison	10	56	42	32.9%	P	**0.75**
Socotec Didcot	50% TEA in acetone	2021	R	North East Lincolnshire Council	10	27	29	-7.6%	G	**1.08**
Socotec Didcot	50% TEA in acetone	2021	R	North East Lincolnshire Council	9	45	33	34.5%	P	**0.74**
Socotec Didcot	50% TEA in acetone	2021	R	Leeds City Council	13	40	29	35.5%	G	**0.74**
Socotec Didcot	50% TEA in acetone	2021	KS	Leeds City Council	12	34	25	37.9%	G	**0.73**
Socotec Didcot	50% TEA in acetone	2021	R	Leeds City Council	9	43	31	40.8%	G	**0.71**
Socotec Didcot	50% TEA in acetone	2021	UC	Leeds City Council	12	31	23	37.4%	G	**0.73**
SOCOTEC Didcot	50% TEA in acetone	2021		**Overall Factor[3] (23 studies)**				**Use**		**0.78**

Discussion of Choice of Factor to use

The bias adjustment factor applied to all 2021 data is 0.78. The applied bias adjustment factor has been calculated using the national diffusion tube bias adjustment factor spreadsheet version 03/22.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes are supplied and analysed by Socotec UK Ltd Didcot, using the 50% triethanolamine (TEA) in water method. Socotec UK Ltd 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 Socotec UK Ltd Didcot 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 Socotec UK Ltd 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

Table 14 - Bias Adjustment Factor

Year	Local or National	National Reference	Adjustment Factor
2021	National	03/22	0.78
2020	National	06/21	0.76
2019	National	09/20	0.75
2018	National	06/19	0.77

NO_2 Fall-off with Distance from the Road

No diffusion tube NO_2 monitoring locations within Bridgend required distance correction during 2021.

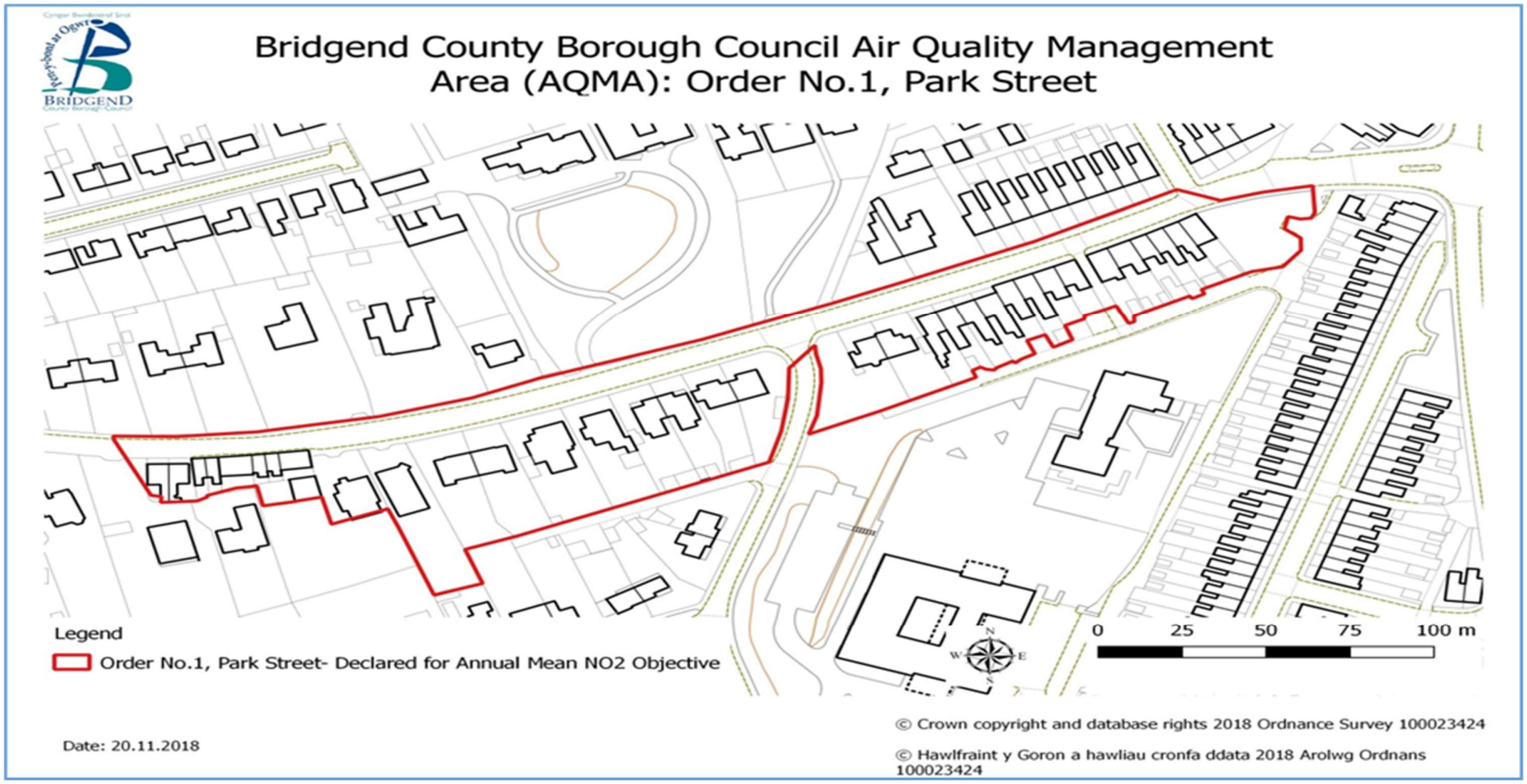
NO_2 Fall-off with Distance from the Road

No automatic NO_2 monitoring locations within Bridgend required distance correction during 2021.

Table 15 - Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Site 1 Name	Annualisation Factor Site 2 Name	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
OBC-133	Cardiff City Centre	Newport, St Julians	0.9106	25.1	17.8	Bias adjustment factor of 0.78 also included in annualised annual mean

Appendix D: AQMA Boundary Maps



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