Merthyr Tydfil County Borough Council 2022

Air Quality Progress Report

In fulfillment of Part IV of the Environment Act 1995

Local Air Quality Management

Date: (September 2022)

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Executive Summary: Air Quality in Our Area

Air Quality in Merthyr Tydfil County Borough

Ansawdd yr Aer ym Mwrdeistref Sirol Merthyr Tudful

Prif darddiad llygredd aer ym Merthyr Tudful yw traffig. Mae CBSMT felly yn bryderus am NO_2. Mae rhwydwaith o diwbiau tryledu yn gweithredu trwy'r sir. Cafodd y lefel uchaf ei gofnodi yn 2013 ac ers hynny wedi lleihau. Yn ddiweddar mae'r lefel wesi sefydlogi ac yn 2019 roedd pob lleoliad o fewn Merthyr Tudful wedi cofnodi lefelau crynodiad NO_2 o fewn cymedr blynyddol yr amcan ansawdd aer.

Er bod pob lleoliad bellach o dan yr amcan ansawdd aer hyd at 2019, mae yn lleoliad o fewn 10% i'r amcan ansawdd aer blynyddol. Ers 2020 mae data wedi gostwng ymhellach a does dim lleoliad o fewn y 10% erbyn hyn. Fel y rhagwelwyd, mae'r crynodiad wedi cynyddu yn ystod 2021, ond, mae pob lleoliad yn dal mwy na 10% yn is na'r amcan ansawdd aer blynyddol. Ers 2017 mae ARhSA wedi ei leoli ar Ffordd Twynyrodyn. Mae mwy o wybodaeth ar <http://uk-

Air Quality in Merthyr Tydfil County Borough

The main source of air pollution within Merthyr Tydfil is from road traffic. As such MTCBC is concerned about NO_2. A network of diffusion tubes operates throughout the district. In the past 8 years NO_2 peaked throughout the district in 2013 and has declined since. This decline has levelled out in recent years. During 2019 all sites within Merthyr Tydfil had achieved NO_2 concentrations within the annual mean air quality objective.

Although all sites are now below the air quality objective up to 2019, one site was still within 10% of the annual mean air quality objective. Data for 2020 has seen a further reduction across the borough with no sites being within 10% of the annual mean air quality objective. As anticipated, concentrations have increased during 2021 however, all sites still remain more than 10% below the annual mean air quality objective. Since 2017 there has been an AQMA in place

air.defra.gov.uk/aqma/local-authorities?la_id=402> a www.merthyr.gov.uk <http://www.merthyr.gov.uk>. Yn dilyn ymgynghoriad cyhoeddus, a chytundeb y Cyngor, cytunodd LLC i weithredu a newid cyfeiriad y traffig ar hyd Stryd Fawr Pontmorlais a Stryd yr Eglwys fel gweithred gychwynnol i ymateb i lefelau NO_2 o fewn yr ARhSA.

Ar Fai 28ain 2019 newidiwyd cyfeiriad y traffig ar hyd Stryd Fawr Pontmorlais a Stryd yr Eglwys. Roedd hwn yn llwybr amgen o Tesco a Chanol y Dref yn hytrach na defnyddio Ffordd Twynyrodyn. Mae'n ymddangos bod wedi symud o ardal yr ARhSA, gyda llai o giwiau ar Ffordd Twynyrodyn.

Mae CBSMT hefyd yn ystyried yr effaith ar ddatblygiadau newydd, a ble mae angen yn defnyddio amodau cynllunio er mwyn gweithredu yn erbyn effeithiau negyddol. Mae'r Cynllun Trafnidiaeth Leol yn cefnogi teithio llesol a defnyddio trafnidiaeth gyhoeddus i leihau'r ddibyniaeth ar geir.

along Twynyrodyn Road. More information is available at http://uk-air.defra.gov.uk/aqma/local-authorities?la_id=402 and www.merthyr.gov.uk. Following public consultation and Council approval, the WG approved the action plan to reverse traffic flow along Pontmorlais High Street and Church Street as an initial action to address concentrations of NO_2 within the AQMA.

On 28th May 2019 traffic flow was reversed along Pontmorlais High Street and Church Street. This provided alternative routes away from Tesco and the Town Centre area other than Twynyrodyn Road. Traffic build-up appears to have shifted away from the AQMA with fewer queues developing on Twynyrodyn Road.

MTCBC also considers the impact on air quality of new developments, and where necessary, planning conditions are used to mitigate any negative effects. The Local Transport Plan supports active travel and use of public transport to reduce reliance on cars.

Gweithredoedd i Wella Ansawdd yr Aer

Wrth ystyried ARhSA Ffordd Twynyrodyn, cynhaliwyd ymgynghoriad cyhoeddus dros 12 wythnos. Ymgynghorwyd y cyhoedd am 3 opsiwn i leihau'r traffig ar Ffordd Twynyrodyn. Ymatebodd y mwyafrif llethol (94%) o blaid newid cyfeiriad y traffig ar hyd Stryd Fawr Pontmorlais a Stryd yr Eglwys. Cytunodd y Cyngor ar gynllun gweithredu i'r perwyl hwn, a'i gyflwyno i Lywodraeth Cymru, ac a gafodd ei dderbyn ganddynt.

Ym mis Tachwedd 2018 cyflwynodd yr adrannau Priffyrdd a Pheirianneg Orchymyn Rheoliadau Traffig. Ar Fai 28ain 2019 newidiwyd cyfeiriad y traffig yn unol â'r cynllun gweithredu a gytunwyd. Mae cyfrifiadau traffig ar gael sydd yn nodi'r arsylwadau a waned gan Swyddogion Iechyd yr Amgylchedd bod llai o draffig ar ARhSA Ffordd Twynyrodyn. Cynhaliwyd arolwg traffig cyn ac ar ôl newid cyfeiriad y traffig ar Stryd Fawr Pontmorlais a gwelwyd bod lleihad yn y niferoedd ceir ar hyd ARhSA Ffordd Twynyrodyn o gyfartaledd o 428 cerbyd ar ddydd Gwener pan oedd lefelau traffig are u huchaf. Gwelwyd peth cynnydd yn y traffig ar Avenue De Clichy a Stryd Fawr

Actions to Improve Air Quality

With regard to the Twynyrodyn Road AQMA, in 2018 a 12 week public consultation took place. The public were consulted on 3 options to reduce traffic use of Twynyrodyn Road. Most respondents (94%) expressed a preference for the option of reversing traffic flow along Pontmorlais High Street and Church Street. The Council approved an action plan to this effect being submitted to Welsh Government, who subsequently approved it.

In Nov 2018 the Highways and Engineering departments issued Traffic Regulation Orders. On 28th May 2019 traffic flow was reversed in accordance with the approved action plan. Traffic counts are available which quantified observations made by Environmental Health Officers that there was less traffic build-up in the Twynyrodyn Road AQMA. The traffic survey carried out prior to and after the reversal of flow along Pontmorlais High Street, showed a reduction in the volume of traffic travelling along Twynyrodyn Road AQMA by an average of 428 vehicles on a Friday when traffic volumes were at their highest. Some traffic build-up around Avenue De Clichy and Pontmorlais

Pontmorlais ar yr adegau prysuraf, fel y dangoswyd yn yr arolwg traffig, gyda chynnydd cyfartalog o 677 cerbyd yn teithio ar yr Avenue De Clichy. Ni ystyrir hyn yn risg i iechyd y cyhoedd gan fod eiddo preswyl wedi ei lleoli i ffwrdd o'r ffordd a does dim ardal ar ei hyd ble mae pobl yn debygol o dreulio 1 awr+. Ar ochr Orllewinol yr Avenue de Clichy ceir yr afon Taf, ac felly does dim ceunant strydoedd yn bodoli. Roedd yr arsylwadau cychwynnol yn awgrymu bod newid cyfeiriad y traffig wedi gwella ansawdd yr aer o fewn yr ARhSA, ac mae hyn wedi parhau i fod yn wir ers hynny.

High Street was observed during peak times which has also been evidenced by the traffic survey, with an average weekday increase of 677 vehicle movements along the Avenue De Clichy. This is not considered likely to pose a public health risk as residential properties are set back from the road and there are no areas along it where people are likely to spend 1 hour+. On the West side of Avenue de Clichy is the River Taff, so there are no possible street canyons. The early observations suggested the traffic reversal made improvements in air quality within the AQMA and this has continued to be the case since.

Blaenoriaethau Lleol a Heriau

Y flaenoriaeth ar gyfer 2019 oedd monitro effeithiolrwydd y cynllun gweithredu. I'r perwyl hwn, gosodwyd mwy o diwbiau tryledu ar hyd y llwybrau newid cyfeiriad traffig a strydoedd cyfagos. Symudwyd y monitor CCE i Stryd Fawr Ponmorlais ble mae o hyd, er ei fod yn llai dibynnol yn ystod 2021. Ers ei weithredu, nid yw'n ymddangos bod cynnydd sylweddol yn lefelau crynodiad NO_2 ar hyd Stryd Fawr Ponmorlais a llwybrau gwyriad eraill.

Local Priorities and Challenges

The priority for 2019 was to monitor the effectiveness of the implemented action plan. To that end, additional diffusion tubes were installed along the traffic reversal route and surrounding streets. The ECC monitor was also relocated to Pontmorlais High Street where it remains although this has proven unreliable during 2021. Since its implementation, the reversal doesn't appear to have significantly increased concentrations of NO_2 along

Roedd lefelau crynodiad NO_2 yn 2020 yn dilyn y cyfnod clo cenedlaethol oherwydd y pandemig coronafeirws yn sylweddol is oherwydd y lleihad mewn traffig. Felly, nid yw'r data ar gyfer 2020 yn gynrychioliad cywir o'r ardal yn arferol. Felly'r flaenoriaeth ar gyfer 2020 oedd parhau i fonitro'r rhwydwaith ac oedi diddymiad yr ARhSA fel y bwriadwyd yn 2021.

Os bydd newid cyfeiriad y traffig yn parhau i wella ansawdd yr aer ar Ffordd Twynyrodyn trwy weddill 2021 yn dilyn llacio mesurau clo, bydd hyn yn golygu y bydd y ARhSA yn cael ei ddiddymu un ai yn 2022 neu 2023. Os yn aflwyddiannus, bydd gwaith ychwanegol yn cael ei ystyried i ddiweddaru cynlluniau gweithredu.

Estynnwyd monitro hefyd i gynnwys mwy o diwbiau tryledu mewn Arolwg Sŵn Llywodraeth, ble gall traffig trwm effeithio ar ansawdd yr aer.

Yn 2018 nododd data tiwbiau tryledu o 6/7 Maes Ladysmith, Heol Caerdydd, CF48 4JH y byddai'r crynodiad NO_2 wedi bod yn fwy na 36µg/m^3, o fewn 10% o gymedr blynyddol yr amcan ansawdd aer. Dangosodd arolygon o dagfeydd traffig wrth i geir gyrraedd/ gadael Ysgol Gynradd Gymunedol Pontmorlais High Street or any other diversion route.

NO_2 concentrations for 2020 following implementation of the national lockdown due to the coronavirus pandemic were significantly lower due to the associated decrease in vehicle movement. As such, the majority of the data for 2020 is not a true representation for the area during usual circumstances. As such, the priority for 2020 was to maintain monitoring of the network and delay the intended revocation of the AQMA in 2021.

If the traffic reversal continues to be successful in improving air quality on Twynyrodyn Road through 2021 following easing of lockdown measures, this will enable the AQMA to be revoked by either 2023 or 2024. If unsuccessful, additional works will be considered in updated action plans.

Monitoring was also extended to include additional diffusion tubes in areas identified by the Welsh Government Noise & Soundscape Survey, where heavy traffic may also affect air quality.

Additionally in 2018 some individual months of diffusion tube data from 6/7 Ladysmith Place, Cardiff Road, CF48 4JH indicated if unaddressed the

Troedyrhiw a cheir yn parcio ar Heol Caerdydd.

Er mwyn penderfynu ar effaith y maes parcio, yn ystod Rhagfyr 2018 ac Ionawr 2019, nid oedd modd ei ddefnyddio ond trwy lwybr unffordd. Roedd y canlyniadau yn ystod cyfnodau 11 a 12 yn 48µg/m³, tra bod cofnodion eraill yn yr ardal yn ystod cyfnod 12 yn dangos bod y system unffordd yn effeithiol wrth wella ansawdd yr aer. Gall hyn fod wrth wella cyfeiriad y traffig neu rwystro pobl ddefnyddio'r maes parcio. Yn dilyn addasu ar gyfer tuedd cafwyd cymedr blynyddol o 34.6µg/m³,yn is na'r lefel o bryder. Yn ystod 2019 roedd y lefel crynodiad NO_2 ar gyfer 6/7 Maes Ladysmith wedi lleihau i 33µg/m³ a dangosodd asesiad pellach o Heol Caerdydd ar 37 Teras Brookfield ffigwr o 27.8µg/m³ yn sylweddol is na'r amcan SSA. Dangosodd Data ar gyfer 2020 bod crynodiad NO_2 6/7 Maes Ladysmith Place wedi lleihau i 25.6µg/m³. Roedd lleihad yn y crynodiad ar gyfer pob lleoliad yn y rhwydwaith, ond oherwydd canlyniadau anarferol y flwyddyn oherwydd y pandemig, mae angen parhau i fonitro er mwyn penderfynu os oes angen rhoi mwy o sylw i'r lleoliad er bod data 2021 yn dangos bod crynodiad NO_2 ar gyfer

annual mean concentration of NO_2 could have exceeded 36µg/m³, within 10% of the annual mean air quality objective. Observations showed bottle necks caused by car access/egress from a car park to the rear of Troedyrhiw Community Primary School, combined with parked cars along Cardiff Road. To determine the impact of the car park, in December 2018 and early January 2019 it was only temporarily accessible via a one way system. Results for period 11 & period 12 were both 48µg/m³, whereas other sites throughout the district showed a noticeable increase in period 12, indicating the one way system was effective at improving air quality. This may be by improving traffic flow or by putting people off using the car park. After bias adjustment the annual mean was 34.6µg/m³, below the level for concern. During 2019 the concentration of NO_2 for 6/7 Ladysmith Place had decreased slightly to 33µg/m³ and an additional tube for further assessment of Cardiff Road, placed at 37 Brookfield Terrace was well below the AQS objective at 27.8µg/m³. Data for 2020 showed that NO_2 concentrations for 6/7 Ladysmith Place decreased to 25.6µg/m³. A reduction in concentrations was the case for all sites within the network however, due to the atypical results for

6/7 Maes Ladysmith ond wedi cynyddu ychydig i 28.1µg/m³.

Cwblhawyd adeiladu'r gyfnewidfa fysiau ar Stryd yr Alarch yn ystod mis Mai 2021 a death yn weithredol ym mis Mehefin 2021. Felly mae'r rhwydwaith wedi ei ymestyn i gynnwys 4 pwynt monitro ychwanegol o gwmpas y gyfnewidfa newydd. Er nad oes blwyddyn lawn o ddata am y lleoliadau newydd, hyd yn hyn nid yw'n edrych bod unrhyw un o'r lleoliadau yn broblematig, ond bydd hyn yn parhau i gael ei fonitro.

the year attributable to the pandemic, continued monitoring is necessary to determine whether this site requires focussed attention in future although data for 2021 show that NO_2 concentrations for 6/7 Ladysmith Place had only marginally increased to 28.1µg/m³.

The newly constructed bus interchange on Swan Street was completed during May 2021 and came into operation during June 2021. As such, the existing network has been extended to include 4 new monitoring points around the vicinity of the new interchange. Although there is not yet a complete year of data for the additional monitoring locations, so far none of locations have shown to be problematic, but will continue to be monitored.

Sut i Wybod Mwy

Gellir cael mwy o wybodaeth am lygredd aer ac adroddiadau ar ansawdd yr aer blaenorol ar www.merthyr.gov.uk. Gellir codi cwestiynau pellach trwy e-bostio PublicHealth@merthyr.gov.uk neu trwy ffonio 01685 725000.

How to Get Involved

Further information on air pollution including access to previous air quality reports is available from www.merthyr.gov.uk. Specific questions can be addressed by emailing PublicHealth@merthyr.gov.uk or by telephoning 01685 725000.

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1 Actions to Improve Air Quality

1.1 Previous Work in Relation to Air Quality

Merthyr Tydfil County Borough Council has previously undertaken the following review and assessment reports as required by Local Air Quality Management:

Report Title	Date	Outcomes
First stage review and assessment	1998	Negligible risk of AQS objective for benzene, 1,3-butadiene, CO and lead being exceeded in the area. Possible risk of objectives for PM_{10}, SO_2 and NO_2 being exceeded.
Second stage review and assessment	2000	Negligible risk of AQS objectives for PM_{10}, SO_2 and NO_2 being exceeded in area. Unnecessary to proceed further with review and assessment process or declare AQMAs.
Updating and screening assessment and progress reports	2003-2005	AQS objectives for 7 pollutants likely to be met at all locations with relevant public exposure. Unnecessary to carry out detailed assessment or declare any AQMAs. Progress reports 2004 & 2005 found no significant changes in air quality and no developments that might affect air quality within the borough.
Updating and screening assessment and progress reports	2006-2008	AQS objectives for the 7 pollutants detailed in regulations likely to be met at all locations with relevant public exposure. Unnecessary to carry out a detailed risk assessment or declare any AQMAs.

		Progress report 2007 found NO_2 levels had increased but within AQS objective of 40µg/m³ at all locations. Level at 55 Twynyrodyn Road was within 10% of the limit and monitoring network expanded in this area. Progress report 2008 found levels increased and at 55 Twynyrodyn Road, a marginal exceedance identified. Considered necessary to proceed to detailed assessment.
Detailed assessment	2009	Reviewed data for monitoring sites on Twynyrodyn Road and modelled NO_2 levels for length of the road. Recommended siting of additional diffusion tubes at various points on road and declaring AQMA.
Updating and screening assessment and progress reports	2009-2011	NO_2 reduced, AQS objectives met at all locations with relevant public exposure. 2010 progress report determined based on reduction no longer necessary to carry out further detailed assessment or declare AQMA. Detailed assessments necessary for 2 new permitted processes and 1 substantially changed installation. Progress report 2011 found NO_2 levels had increased throughout the borough, with marked exceedance at 55 Twynyrodyn Road. Considered necessary to increase number of monitoring sites on Twynyrodyn Road prior to declaring AQMA in relation to this site.

Detailed assessment	2011	Reviewed emissions data from Prince Charles Hospital combustion plant. Concluded emissions will not result in any exceedances of objectives unless on-site emergency generators used for extended periods.
Updating and screening assessment and progress reports	2012-2014	No new developments or proposed developments that could be considered to adversely affect air quality. 1 exceedance of NO_2 at 55 Twynyrodyn Road. Progress report 2013 found action to reduce NO_2 levels at 55 Twynyrodyn Road, has reduced it to below AQS objective. Additional monitoring found further location on same road link where NO_2 levels exceeded AQs objective. Progress report 2014 identified new bus station development proposed may adversely affect NO_2. Environmental Health department liaised with Regeneration Group to ensure air quality considered in planning process. NO_2 levels on Twynyrodyn Road had increased to exceed AQS objective. Unclear if temporary and related to ongoing changes to traffic flow. Further monitoring proposed. Detailed assessment and declaration of AQMA on Twynyrodyn Road necessary.
Detailed assessment	2015	Elevated NO_2 on Twynyrodyn Road associated with traffic. Wind speed and direction, and 2 storey terraced housing without front gardens resulted in NO_2 accumulating around 55 Twynyrodyn Road.

		Predominantly associated with uphill traffic during early evening. Considered necessary to declare AQMA from Western End of Twynyrodyn Road to 147 Gilfach Cynon. MTCBC declared AQMA on 30th Jan 2017.
Updating and screening assessment and progress reports	2015-2017	Proposed bus station could adversely affect air quality. Modelling indicates likely to comply with AQS objectives, to be monitored with diffusion tubes prior to bus station opening as modelling based on limited data. NO_2 exceedances were contained within AQMA on Twynyrodyn Road. Action plan under development for public consultation, on options to improve traffic flow and reduce traffic numbers. Additional monitoring in Swansea Road in anticipation of Trago Mills opening, attracting additional traffic to Swansea Road area.
Annual report	2018	NO_2 exceedances were contained within AQMA on Twynyrodyn Road. Action plan to reverse traffic flow along Pontmorlais High Street and Church Street approved by Welsh Government following public consultation and Council approval. Impact of Trago Mills on Swansea Rd has not resulted in annual mean within 10% of AQS objectives. Monitoring network reviewed and as of Jan 2019 network will be extended to include traffic reversal

		area, Troedyrhiw and areas identified in Welsh Government Noise and Soundscape survey.
Annual report	2019	Action plan implemented to reverse traffic flow along Pontmorlais High Street and Church Street on 28th May 2019. Additional monitoring locations added to the network used to assess any changes in vehicle routes around the town centre and along Pontmorlais High Street and the impact it might have on air quality. A decrease in levels of NO_2 on Swansea Road around the Trago Mills site has been observed. All sites within the AQMA are now below the annual air quality objective however one site remains within 10% of the AQS objective.
Annual report	2020	Continued monitoring of network to assess effectiveness of the traffic reversal and changes around the town centre and along Pontmorlais High Street. Proposal to revoke the AQMA in 2021 if levels were shown to have continued to remain outside 10% of the AQS objective.
Annual report	2021	Continued monitoring of network to assess the effectiveness of the traffic reversal and changes around the town centre and along Pontmorlais High Street. Proposal to delay revocation of the AQMA to either 2023/2024. Continued demonstration of concentrations below 10% of the AQS objective means the data would be robust enough to confidently revoke the AQMA.

NO_2 continued to exceed the AQS objective in 2017 along Twynyrodyn Road (stretch near 55 Twynyrodyn Road within AQMA). This was in line with results in previous years.

MTCBC currently has one AQMA, Twynyrodyn Road. Following a detailed assessment in 2015 it was declared in Jan 2017. It was declared due to elevated NO_2 concentrations caused by road traffic. A draft action plan identified 3 possible changes to traffic flow anticipated to improve traffic flow around the town centre and consequently reduce NO_2 in the AQMA. A 12 week public consultation was carried out from 16th March 2018 to 8th June 2018. The majority (94%) of consultation responses were in favour or reversing the traffic flow along Pontmorlais High Street and Church Street. Following the public consultation, on 27th June 2018 the Council approved the action plan for reversing traffic flow along Pontmorlais High Street for submission to Welsh Government. Welsh Government approved the action plan on 17th July 2018. The Highways and engineering departments issued the relevant traffic management orders and following these on 28th May 2019 reversed the traffic flow along Pontmorlais High Street & Church Street.

During some months in 2018 there was an elevated NO_2 concentration at Ladysmith Place, Troedyrhiw. This required further investigation. Observations found traffic was building up at the junction of Phyllis Street & Cardiff Road, where cars were accessing and egressing a small car park to the rear of Troedyrhiw Community School. As a semi-rural area a large proportion of children attending the school travel by car. To determine the effect of the car park, in December 2018 a one way system was implemented for 4 weeks, continuing into early January 2019. Most sites across the district had higher NO_2 concentrations in period 12 than period 11, but at 6/7 Ladysmith Place the concentration remained the same. This indicates either lower traffic numbers or better traffic flow had counteracted the normal cold weather deterioration in air quality. As the annual mean NO_2 concentration was below 36µg/m³ (more than 10% below the objective) in 2018 no further action was planned at that time. Monitoring was extended during 2019 further along Cardiff Road, Troedyrhiw to monitor if the section of road is likely to breach the AQS objective. Both 6/7 Ladysmith Place & 37 Brookfield Terrace were more than 10% below the AQS at 33.2µg/m³ and 27.8µg/m³ respectively for that year.

Data for 2020, which was atypical for 75% of the year showed that 6/7 Ladysmith Place and 37 Brookfield Terrace measured annual mean concentrations of 25.6µg/m³ and 20.9µg/m³ respectively, a notable decrease from 2019 data. Comparison of periods 1, 2 and 3 of 2019 and 2020, where data for that period of 2020 was more typical, when averaged show a reduction of NO_2 concentrations at both sites. The unadjusted average

for 6/7 Ladysmith Place was 50.8µg/m³ in 2019 and 42.3µg/m³ in 2020. Similarly, the unadjusted average for 37 Brookfield Terrace was 44.7µg/m³ in 2019 and 32.8µg/m³ in 2020. Although the UK was not subject to a mandatory lockdown for periods 1, 2 and 3, it is possible that there was a voluntary reduction in travel for all purposes as media coverage and public fear increased over the beginning of the year, which could have contributed toward the reduction in NO_2 concentrations.

The anomalous data for 2020 presented an issue in terms of data continuity for longer-term demonstration of the effects of the traffic reversal on NO_2 concentrations within the AQMA in addition to ongoing focus on Cardiff Road. Notwithstanding, data for 2021 is encouraging at both 6/7 Ladysmith Place and 37 Brookfield Terrace, with the mean concentrations of NO_2 at each site being 28.8µg/m³ and 23.6µg/m³ respectively. In terms of the AQMA, data for 2021 is also encouraging, with all sites in and around the AQMA being more than 10% below the AQS objective of 40µg/m³. This is also the case for all monitoring locations across the Borough.

1.2 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when air quality is close to or above an acceptable level of pollution (known as the air quality objective (Please see Appendix A)). After declaring an AQMA the authority must prepare an Air Quality Action Plan (AQAP) within 18 months setting out measures it intends to put in place to improve air quality to at least the air quality objectives, if not even better. AQMAs are seen by local authorities as the focal points to channel resources into the most pressing areas of air pollution as a priority.

A summary of AQMAs declared by Merthyr Tydfil County Borough Council can be found in Table 1.1. Further information relating to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://www.merthyr.gov.uk/resident/pests-pollution-food-hygiene/air-pollution/ and in Appendix D.

MTCBC proposes revocation of the Twynyrodyn Road AQMA in 2023 or 2024 if all sites remain within and more than 10% below the AQS objective (see monitoring section).

Table 1.1 – Declared Air Quality Management Areas

AQMA	Relevant Air Quality Objective(s)	Comments on Air Quality Trend	District	Description	Action Plan
Twynyrodyn Road	NO_2 annual mean concentration	Data post Period 6 of 2019 shows an improvement in air quality in the AQMA since the reversal of the traffic on Pontmorlais High Street was implemented on May 28th 2019. Further monitoring has shown marginal increase from 2020 however, concentrations are well within concentration limits.	Merthyr Tydfil County Borough Council	An area encompassing a number of properties from Tesco Roundabout to Gilfach Cynon	Air Quality Action Plan 2018 https://www.merthyr.gov.uk/resident/pests-pollution-food-hygiene/air-pollution/

AQMA boundary maps within Merthyr Tydfil County Borough can be viewed at:

https://laqm.defra.gov.uk/images/aqma_maps/1476_Merthyr%20Tydfil%20AQMA.jpg and are included in Appendix D.

1.3 Implementation of Action Plans

MTCBC has taken forward a number of measures during 2017 - 2020 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 1.2. More detail on these measures can be found in the Air Quality Action Plan at www.merthyr.gov.uk relating to any designated AQMAs.

Air Quality Action Plans are continuously reviewed and updated whenever deemed necessary, but no less frequently than once every five years. Such updates are completed in close consultation with local communities.

Key measures completed in 2018 are: following public consultation and Council approval, the action plan was submitted to and approved by Welsh Government. Traffic management orders were published in November 2018 and following this on 28th May 2019 the traffic flow was reversed along Pontmorlais High Street and Church Street

MTCBC has used the following measures to monitor the impact of the reversal of the traffic flow:

Diffusion tube monitoring was extended to include the traffic reversal area and some surrounding streets where it was possible that people could take alternative routes. This began in January 2019; therefore it was anticipated that in 2020, the 12 months of data would be available for bias adjustment and review, particularly monitoring periods 6-12.

Due to the pandemic, the data for 2020 was atypical and not a true representation of NO_2 concentrations under normal circumstances and as such, it was not possible to make a fair comparison with post-period 6 data for 2019. Although there was evidence of fewer traffic queues on Twynyrodyn Road following the traffic reversal resulting in lower NO_2 concentrations, it is prudent that robust data be collected before a decision to revoke the AQMA can be made. It was anticipated that the significantly lower NO_2 concentrations resulting from the reduction in vehicle movements due to lockdown measures, that these would increase as the country returned to normal. Data for 2021 is encouraging with the highest concentration of 33µg/m³ at 51Twynyrodyn Road being 18% below the AQS of 40µg/m³. If annual mean NO_2 concentrations within the AQMA continue to remain below 36µg/m³, this will enable revocation of the AQMA in 2023/2024.

Although air quality in the Merthyr Tydfil Borough is encouraging in terms of NO_2 concentrations as they relate to the statutory limits, the existing Action Plan is now due for

review and updating and will focus on further improvements that can be made whilst incorporating the principles laid out in the Welsh Government's Clean Air Action Plan for Wales. This can be viewed at: https://gov.wales/sites/default/files/publications/2020-08/clean-air-plan-for-wales-healthy-air-healthy-wales.pdf

Figure 1.1 – Timeline of events for the Twynyrodyn Road AQMA

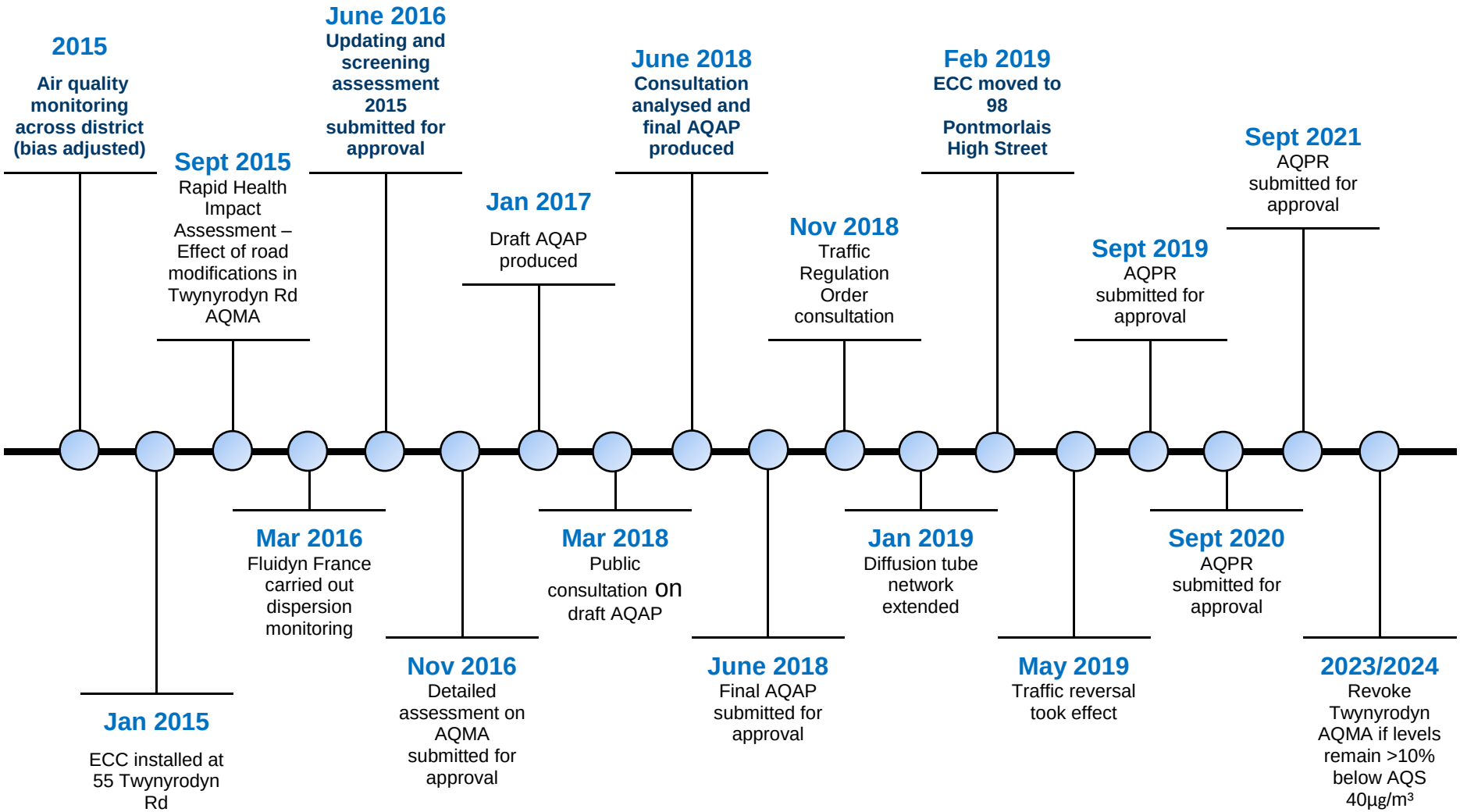


Table 1.2 – Progress on Measures to Improve Air Quality

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
1	Reduce emissions in the AQMA by providing safer pedestrian routes to and from the town centre, reducing vehicle numbers	Reduce emissions in the AQMA by providing safer pedestrian routes to and from the town centre, reducing vehicle numbers	MTCBC	2020	2021-22	Reduction in NO_2 at monitoring sites along Twynyrodyn Road and reduced traffic counts along Twynyrodyn Road	Maintain concentrations more than 10% below AQS.	Traffic data modelling carried out which shows pedestrian crossing should not increase NO_2 concentrations within the AQMA	Works have been completed and ongoing monitoring is required to cross reference with new traffic count data to assess any impact, positive or negative within the AQMA	2022	Traffic counts carried out once the new crossing is in place will indicate that people feel safer to access the town centre on foot from the southern end of town therefore reducing vehicle numbers around the AQMA

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
2.	Reversal of 1-way traffic on both Pontmorlais High Street and Church Street (AQAP 2018)	Reduce emissions in the AQMA by providing alternative routes from the town centre)	MTCBC	2017-2018	2019-2020	Reduction in NO_2 at monitoring sites along Twynyrodyn Road, and reduced traffic counts along Twynyrodyn Road	Reduction of 10µg/m^3 at monitoring sites 14 and 21.	In 2021 site 14 has reduced by 12.3 µg/m^3 and site 21 has reduced by 15.7 µg/m^3 since 2017. There has been a reduction in levels of NO_2 within the AQMA with all sites now below the AQS objective of 40µg/m^3	Although concentrations have marginally increased, they remain more than 10% below the AQS objective of 40µg/m^3	2020	The implementation of the action plan seems to have reduced NO_2 within the AQMA post Period 6 (2019). Despite a marginal increase it is anticipated that concentrations will remain below the AQS objective

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
3.	Increase of environmental charges through permit systems	Environmental Permits charges set by Welsh Government and subject to annual review are according to risk, encouraging businesses to comply with permit conditions to operate at lowest applicable risk for process in question	MTCBC			Proportion of businesses in lowest risk category for their type of operation	0% No permitted processes operate within the AQMA	92% (12 out of 13 active permitted processes) were within lowest risk category for their type of operation in 2021	Newly permitted businesses are being given support to reduce their risk to the lowest possible for each site and process	2021	Following inspections businesses are guided on how to achieve full permit compliance
4.	Saturday shuttle bus provision	Reduce journeys to and from the town centre by providing an alternative (free during a 6-week trial)	MTCBC	2018	2018	Number of people getting on and off the shuttle bus at the Red house and College stops	<1% Extremely hard if not impossible to prove.	Use of the shuttle bus was low and it ceased to operate on 25th December 2018.	The trial was completed and it was found to be unviable	2018	The aim was to bring people to the Town Centre from the outlying retail areas to generate income. The lack of use meant operating the bus was not economically viable

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
5.	Cycle to work scheme	Salary sacrifice scheme towards purchase of bicycle	Cycle Solutions / Merthyr Tydfil Rewards	2010	Ongoing	Number of people joining scheme	<1% Extremely hard if not impossible to prove.	Scheme attracts a handful of people every year. To date 250 people have joined the scheme	Unknown	Ongoing / periodic purchase windows	The aim is for MTCBC works to cycle to work. Although many live in Merthyr Tydfil only a few live within or travel through the AQMA and as such effects will be marginal. There is no way of checking of those who have accessed the scheme whether and how often they cycle to work.

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
6.	Walking to school initiatives	Encouraging primary school students to walk to school	MTCBC	2010	Ongoing	Number of students walking to school	<1% Extremely hard if not impossible to prove.	Not monitored	Not monitored	Ongoing	Schools including Twynyrodyn Community Primary school are able to take part in schemes to encourage walking to school including addressing road safety, walking buses, etc. This includes a Walk to School week and Kerbcraft Child Pedestrian Training. It is unclear how effective they are at changing parental choice to drive or walk in the long run. There are plans to obtain baseline data on how students travel to school in future.

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
7.	Scoot to school	Training to primary school children to travel to school by scooter	Sustrans	2010	Ongoing	Number of students scooting to school	<1% Extremely hard if not impossible to prove	Not monitored	Not monitored	Ongoing	It is unclear whether being a fun activity means it causes short term rather than long term changes
8.	National Standards Cycling Scheme	Training year 6 students on cycling safety levels 1 & 2	Sustrans / MTCBC	Pre 2010	Ongoing	Number of people signing up to schemes	<1% Extremely hard if not impossible to prove	Consistently high uptake up to national lockdown	Not monitored	Ongoing	By delivery to all 22 primary schools it aims to encourage students starting secondary school to cycle to school. Although many take the course the number who then start secondary school by cycling and those who maintain it throughout their time at secondary school is not known

2 Air Quality Monitoring Data and Comparison with Air Quality Objectives

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.

Merthyr Tydfil County Borough Council undertook automatic (continuous) monitoring at 1 site during 2021 however, the equipment developed a fault and was only operational for 4.9% of the year and as such has not yielded valid data for the monitoring year. PM_{10} and $PM_{2.5}$ are monitored by Merthyr (South Wales) Ltd as a planning condition for the Ffos-y-Fran land reclamation scheme, an opencast reclamation site. They operate the TEOM at Twynyrodyn Community Primary School. Table 2.1 presents the details of the sites. National monitoring results are available at https://uk-air.defra.gov.uk/data/data-availability

Maps showing the location of the monitoring sites are provided in Figure 2.1. Further details on how the monitors are calibrated and how the data have been adjusted are included in Appendix C.

2.1.2 Non-Automating Monitoring Sites

Merthyr Tydfil County Borough Council undertook non-automatic (passive) monitoring of NO_2 at 31 sites during 2021 and added a further 4 sites from period 7 as a result of the coming into operation of the new bus interchange at Swan Street. Table 2.2 presents the details of the sites.

Maps showing the location of the monitoring sites are provided in Figure 2.2. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

Table 2.1 – 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)
APM1	Twynyrodyn School	Suburban		305821	206008	PM_{10} $PM_{2.5}$	TEOM	2.43	0	0	N/A
ECC	98 Pontmorlais	Kerbside		304987	206411	NO_2	ECC	3	0	0	2.9

Note2s:

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

Figure 2.1 – Maps of Automatic Monitoring Sites

APM1 LOCATION

ECC LOCATION

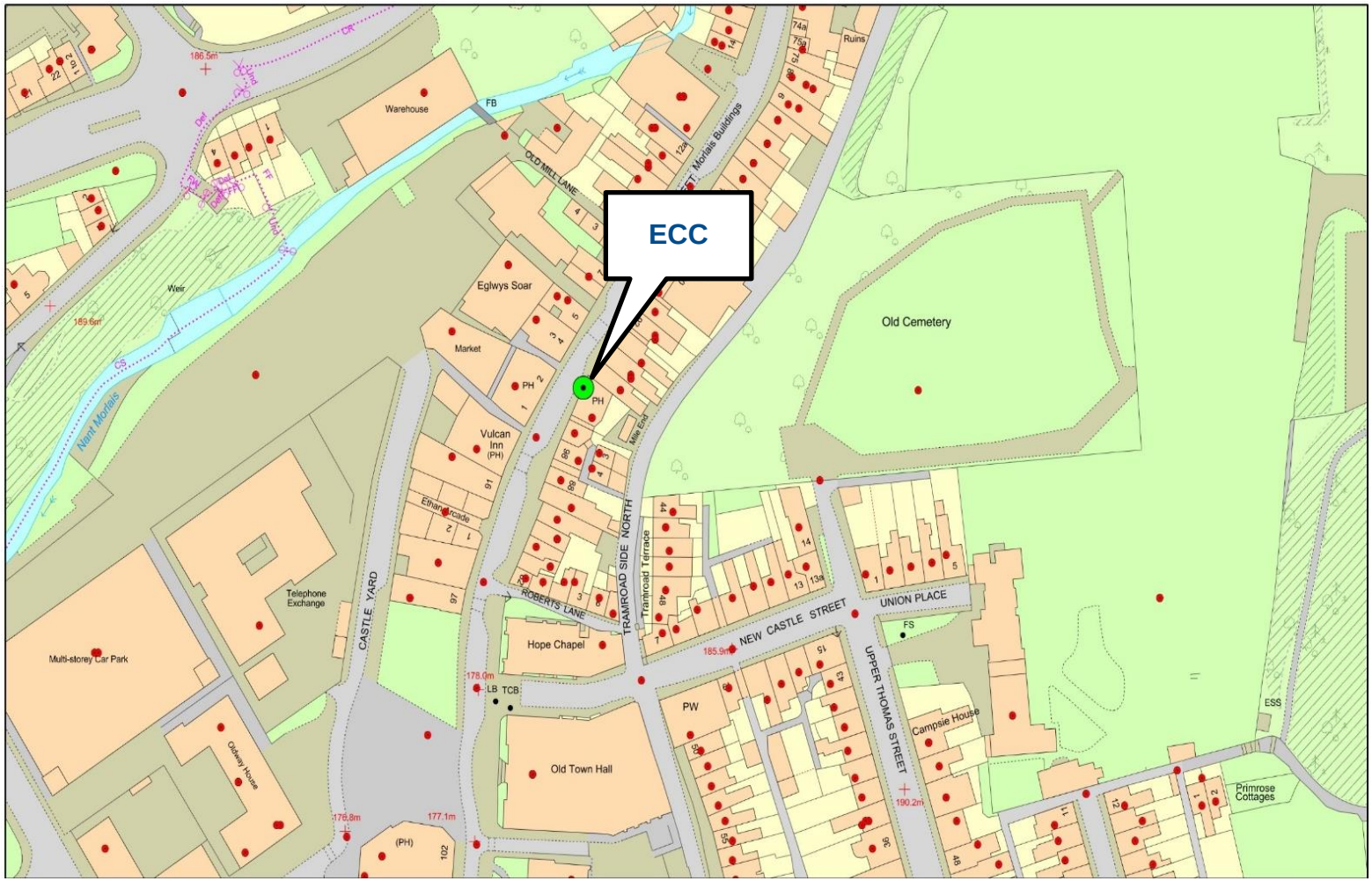


Table 2.2 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
1	Imperial Hotel	Roadside		305042	206524	2.3	N	0	3.4	3.4
2	Civic Centre	Urban Background		304743	206261	1.9	N	0	43.3	43.3
3	Twynyrodyn Community Primary School	Suburban		305832	205941	2.1	N	0	52.8	52.8
4	15 Lower High Street	Urban Centre		305001	205763	2.5	N	0	3.6	3.6
5	1 Alma Street	Roadside		305140	205910	2.3	N	0	1.1	1.1
6	11 Mardy Terrace, Plymouth Street	Roadside		305426	205144	2.3	N	0	5.1	5.1
7	36 Brynteg, Treharris	Roadside		309640	197033	2.1	N	0	1.6	1.6
8	Victoria Street Taxi Rank	Urban Centre		304866	206137	2.3	N	0	3.4	3.4
9	Six Bells Estate	Suburban		303525	206388	1.9	N	0	6.3	6.3
10	11 Park Place, Penydarren Road	Roadside		305180	206744	2.3	N	0	1.6	1.6
11	11 Alexandra Terrace lamp-post	Roadside	Twynyrodyn Road AQMA	305382	205872	3.0	N	1.7	3.0	3.0

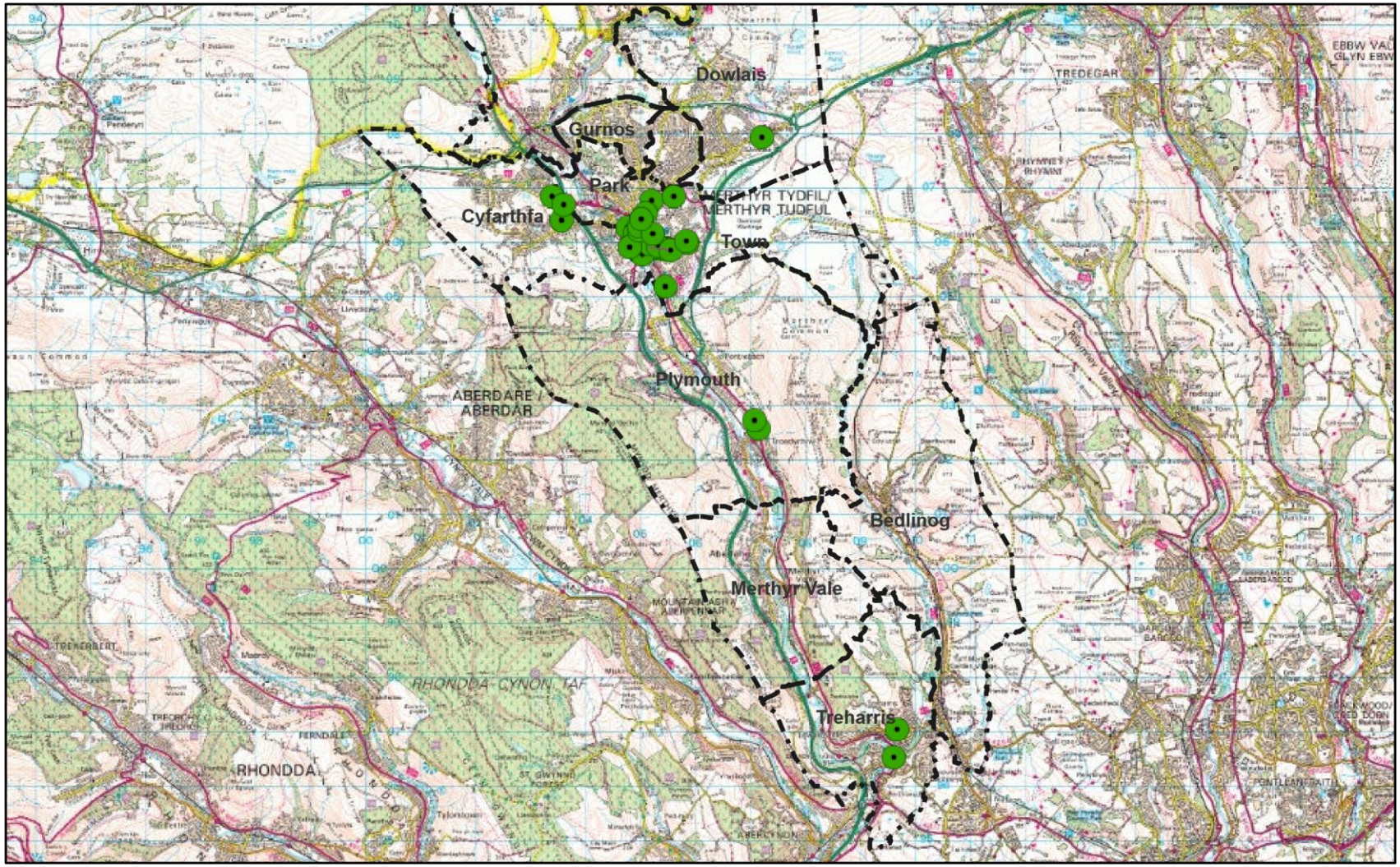
Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
12	Dowlais Upper	Roadside		307171	207915	2.4	N	0	1.6	1.6
13	110 High Street	Urban Centre		304947	206261	2.5	N	0	3.2	3.2
14	55 Twynyrodyn Road	Roadside	Twynyrodyn Road AQMA	305410	205410	2.5	N	0	2.3	2.3
15	Quakers Yard	Suburban		309573	196518	2.0	N	0	3.4	3.4
16	Erw Las	Suburban		303360	206822	2.2	N	0	37.0	37.0
17	119 High Street Corner	Urban Centre		304942	206204	3.0	N	0	1.0	1.0
18	91 Twynyrodyn Road	Roadside	Twynyrodyn Road AQMA	305217	205880	2.4	N	0	2.3	2.3
19	40 William Street	Roadside	Twynyrodyn Road AQMA	305299	205865	2.1	N	0	5.3	5.3
20	17 Court Terrace	Roadside	Twynyrodyn Road AQMA	305149	205906	2.3	N	0	1.5	1.5
21	51 Twynyrodyn Road	Roadside	Twynyrodyn Road AQMA	305394	205871	2.3	N	0	1.5	1.5
22	15 Arfryn Terrace	Roadside	Twynyrodyn Road AQMA	305147	205906	2.3	N	0	4.9	4.9
23	98 Pontmorlais	Urban Centre		304987	206411	2.7	Y	0	2.9	2.9
24	64 Gilfach Cynon	Roadside	Twynyrodyn Road AQMA	305415	205863	2.1	N	1.0	3.7	3.7
25	37 Brookfield Terrace	Roadside		307034	202698	2.3	N	0	1.1	1.1

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
26	6 Windsor Terrace	Suburban		305296	205895	2.3	N	0	2.9	2.9
27	4 Somerset Place, Union Street	Suburban		305182	206138	2.6	N	0	6.0	6.0
28	48 Darren View	Suburban		305579	206811	2.1	N	0	1.4	1.4
29	6/7 Ladysmith Place	Roadside		307112	202547	2.6	N	0	3.4	3.4
30	Bron-Gelli, Swansea Road	Roadside		303570	206676	2.1	N	0	8.4	8.4
31	Caedraw Flats Downpipe	Roadside		304782	205886	2.1	N	0	5.7	5.7
1a	Swan Street, Lamp-post	Roadside		304835	205924	2.5	N	0	2.8	2.8
2a	Picton House, Swan Street	Urban Centre		304898	205929	2.5	N	0	2.4	2.4
3a	High Street Chapel	Urban Centre		304917	206009	2.7	N	0	5.7	5.7
4a	Graham Way, River Walk	Urban Centre		304840	206058	2.7	N	0	4.3	4.3

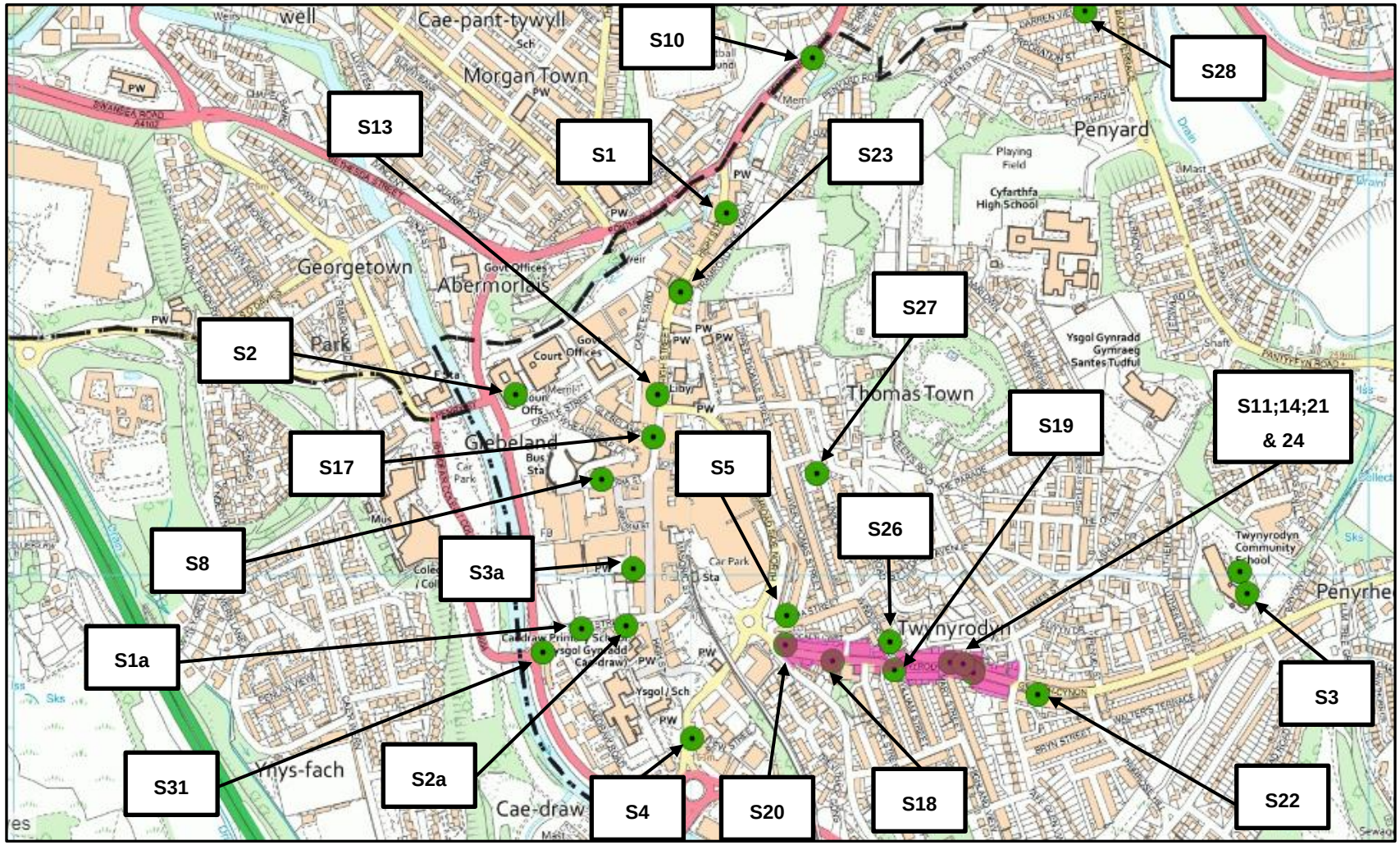
Notes:

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

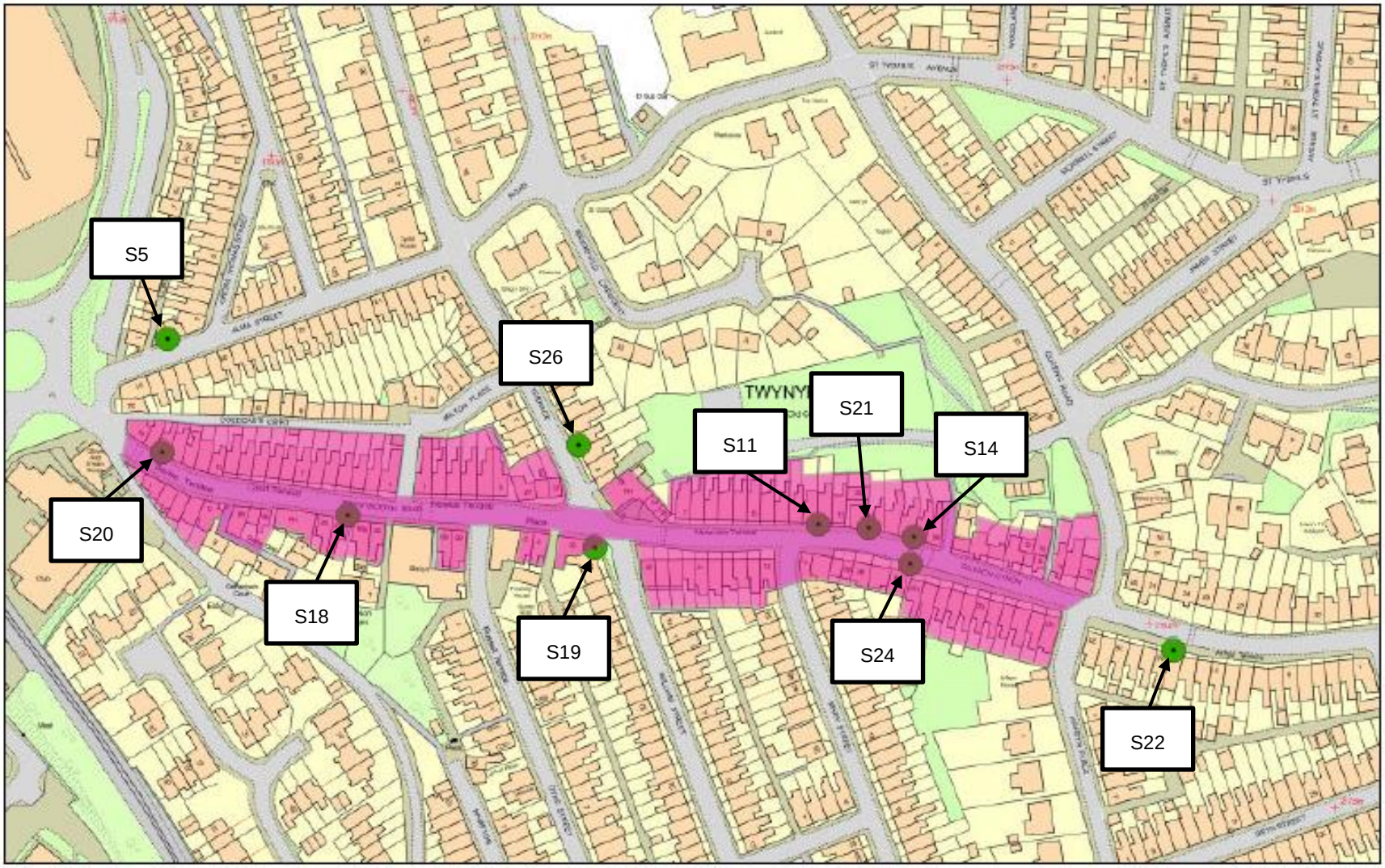
Figure 2.2 – Maps of Non-Automatic Monitoring Sites across County Borough



Map of Non-Automatic Monitoring Sites across Town Ward



Map of Non-Automatic Monitoring Sites across Twynyrodyn



2.2 2021 Air Quality Monitoring Results

Table 2.3 – Annual Mean NO_2 Monitoring Results ($\mu g/m^3$)

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2021 (%) [2]	2017	2018	2019	2020	2021
ECC	Roadside / Urban Centre	Automatic	4.9	4.9	**41.1**	39.9	20.8	17.7	-
1	Roadside	Diffusion Tube	100	100	21.3	20.8	23.1	21.4	25.9
2	Urban Background	Diffusion Tube	100	100	17.9	15.2	16.6	11.7	12.4
3	Suburban	Diffusion Tube	100	100	11.4	10.7	11.1	8.4	8.5
4	Urban Centre	Diffusion Tube	100	100	26.9	29.3	24.9	19.1	21.8
5	Roadside	Diffusion Tube	100	100	18.5	18.1	22.3	13.8	16.5
6	Roadside	Diffusion Tube	100	100	15.9	17.3	25.3	18.8	19.9
7	Roadside	Diffusion Tube	100	100	-	-	17.9	13	13.9
8	Urban Centre	Diffusion Tube	100	100	22.2	20.4	18.8	15.1	15.1
9	Suburban	Diffusion Tube	100	100	10.2	10.0	10.6	7.4	7.9
10	Roadside	Diffusion Tube	100	100	-	-	30.7	26.1	28.8
11	Roadside	Diffusion Tube	100	100	**40.5**	**40.3**	35	24.6	29.7
12	Roadside	Diffusion Tube	100	100	23.4	23.3	22	17.6	21.0
13	Urban Centre	Diffusion Tube	100	100	-	-	21.7	19.4	23.0
14	Roadside	Diffusion Tube	100	100	**40.7**	39.6	33.2	24.7	29.1

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2021 (%) [2]	2017	2018	2019	2020	2021
15	Suburban	Diffusion Tube	100	100	12.8	12.2	11.5	9.5	10.1
16	Suburban	Diffusion Tube	100	100	12.9	12.1	11.6	8.8	10.0
17	Urban Centre	Diffusion Tube	83	83	-	-	18.9	14.8	17.3
18	Roadside	Diffusion Tube	100	100	26.2	26.3	24.1	18.9	20.9
19	Roadside	Diffusion Tube	100	100	21.9	20.3	19.1	14.8	16.3
20	Roadside	Diffusion Tube	100	100	28.6	29.4	25.9	20.2	24.1
21	Roadside	Diffusion Tube	100	100	**46.2**	**47.0**	38.2	25.7	33.0
22	Urban Centre	Diffusion Tube	100	100	31.8	29.2	26	18.5	21.7
23	Roadside	Diffusion Tube	100	100	-	-	18.3	14.5	17.6
24	Roadside	Diffusion Tube	100	100	25.2	23.7	23.8	17.4	16.8
25	Suburban	Diffusion Tube	100	100	-	-	27.8	20.9	23.6
26	Suburban	Diffusion Tube	100	100	16.6	17.7	16.8	12.6	14.0
27	Suburban	Diffusion Tube	83	83	-	-	13.1	10.7	10.9
28	Roadside	Diffusion Tube	100	100	-	-	16.2	12.2	14.6
29	Roadside	Diffusion Tube	100	100	33.0	34.6	33.2	25.6	28.8
30	Roadside	Diffusion Tube	100	100	17.0	20.0	17.8	14.4	16.7
31	Roadside	Diffusion Tube	100	100	-	-	22.1	13.8	17.4
1a	Roadside	Diffusion Tube	50	50	-	-	**-**	**-**	19.6(2)

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
2a	Urban centre	Diffusion Tube	50	50	-	-	**-**	**-**	14.9(2)
3a	Urban Centre	Diffusion Tube	33	33	-	-	**-**	**-**	14.1(1)
4a	Urban Centre	Diffusion Tube	42	42	-	-	-	-	11.8(1)

Notes:

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

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

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%).

Figure 2.3 – Trends in Annual Mean NO_2 Concentrations

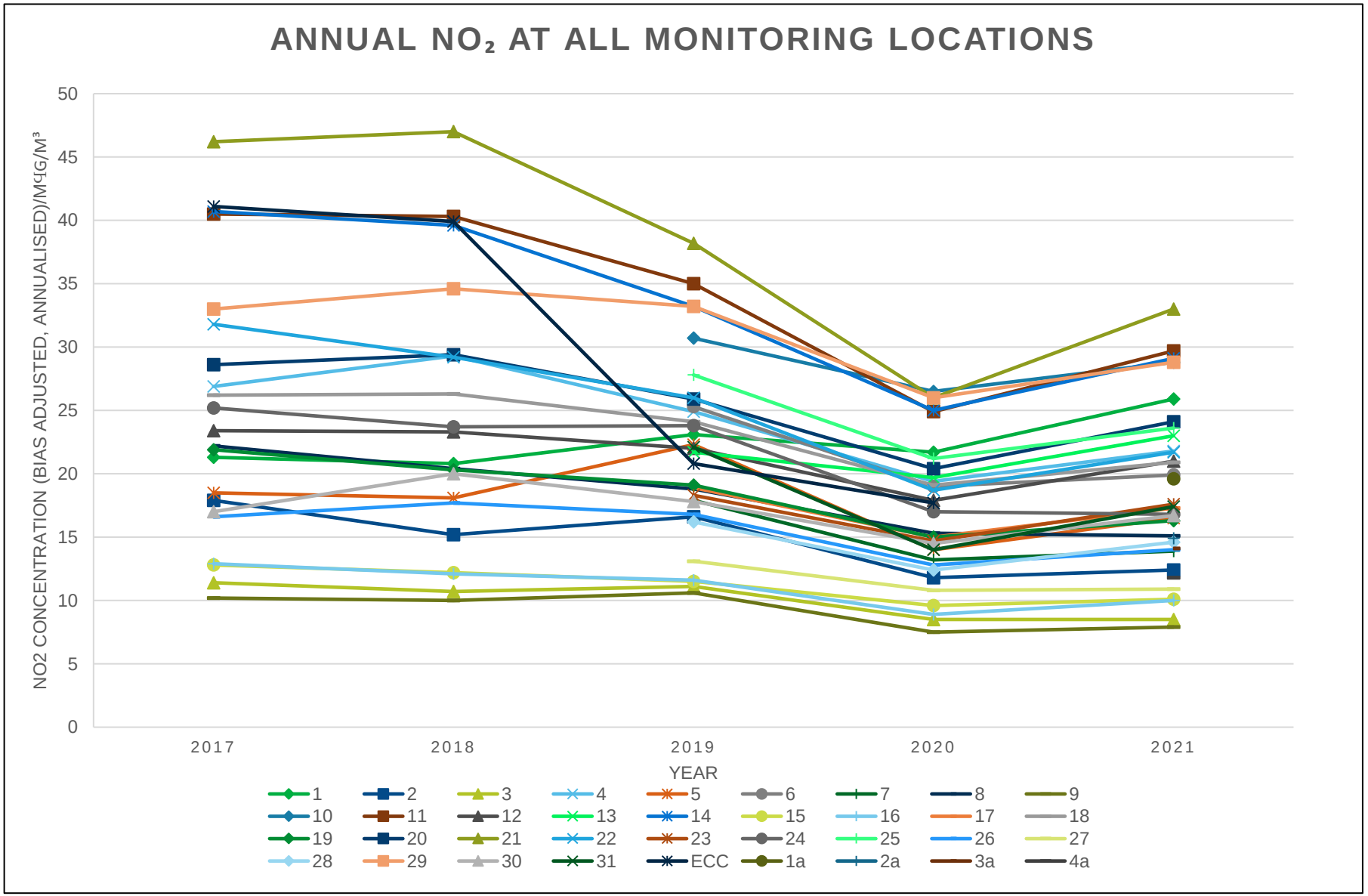


Figure 2.4 – Trends in Annual NO_2 Concentrations – monitoring locations outside the Twynyrodyn area

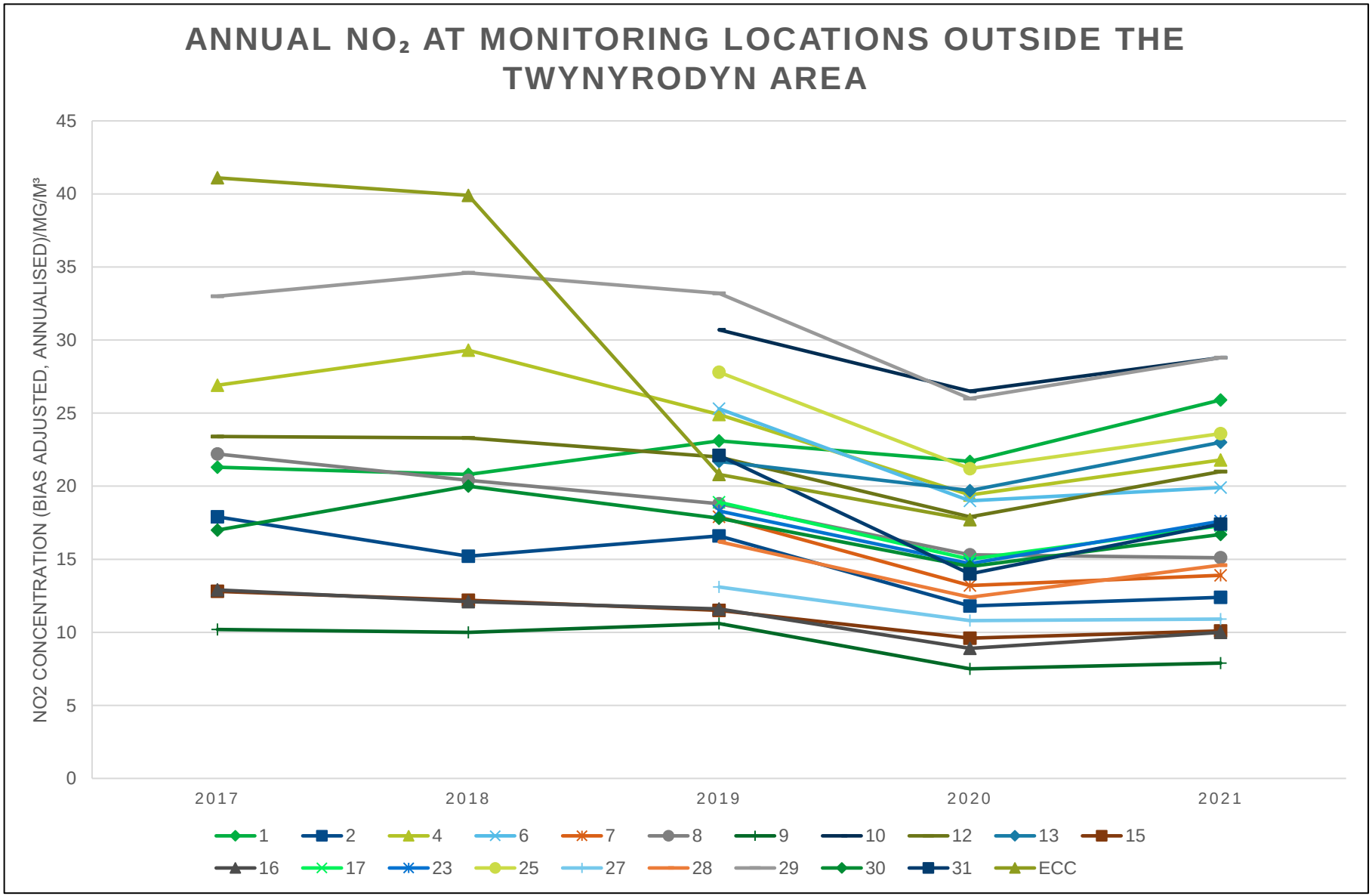


Figure 2.5 – Trends in Annual Mean NO_2 Concentrations – monitoring locations within the Twynyrodyn area

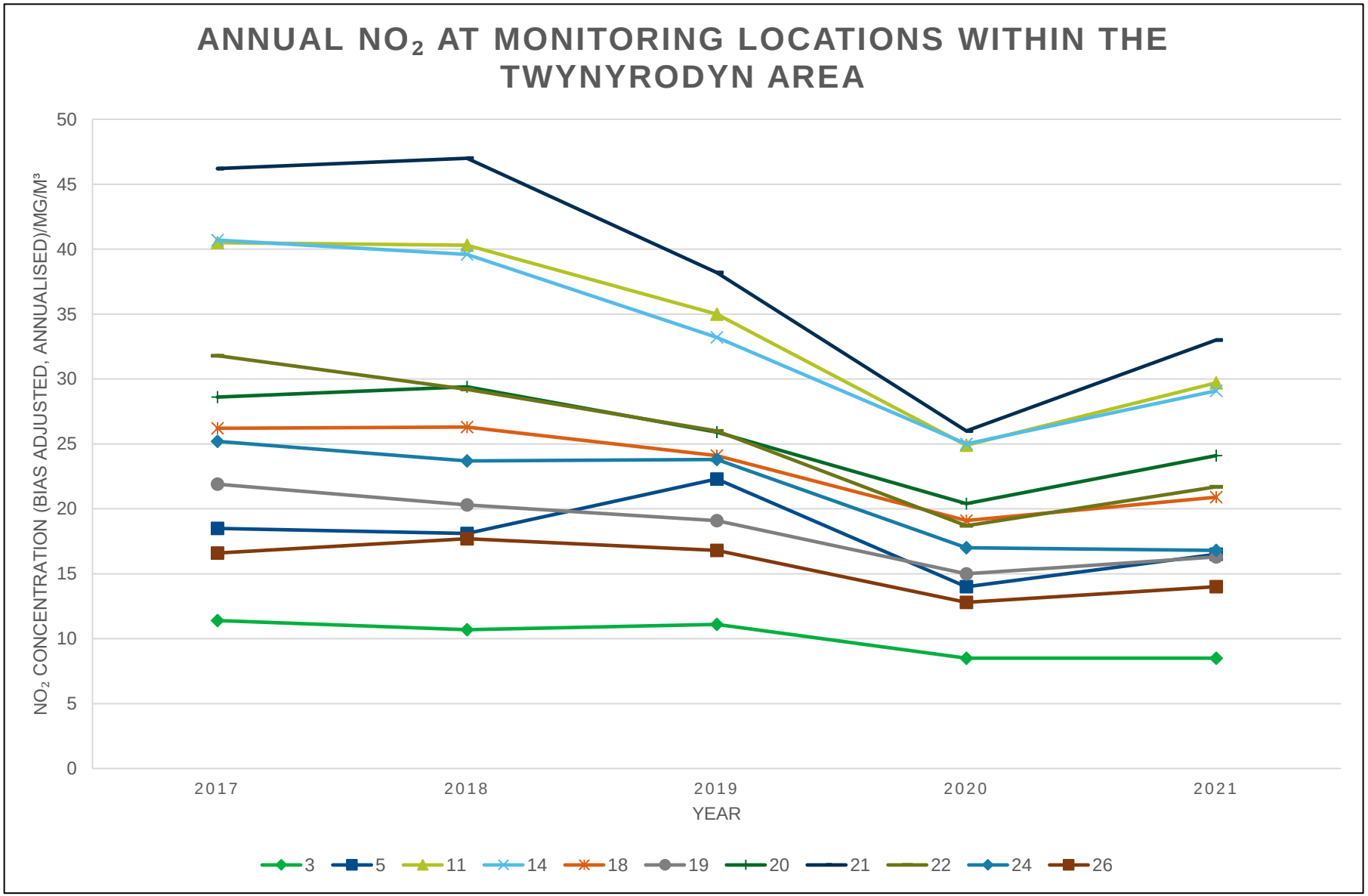


Figure 2.6 - Trends in Annual Mean NO_2 Concentrations – monitoring locations on Twynyrodyn Road

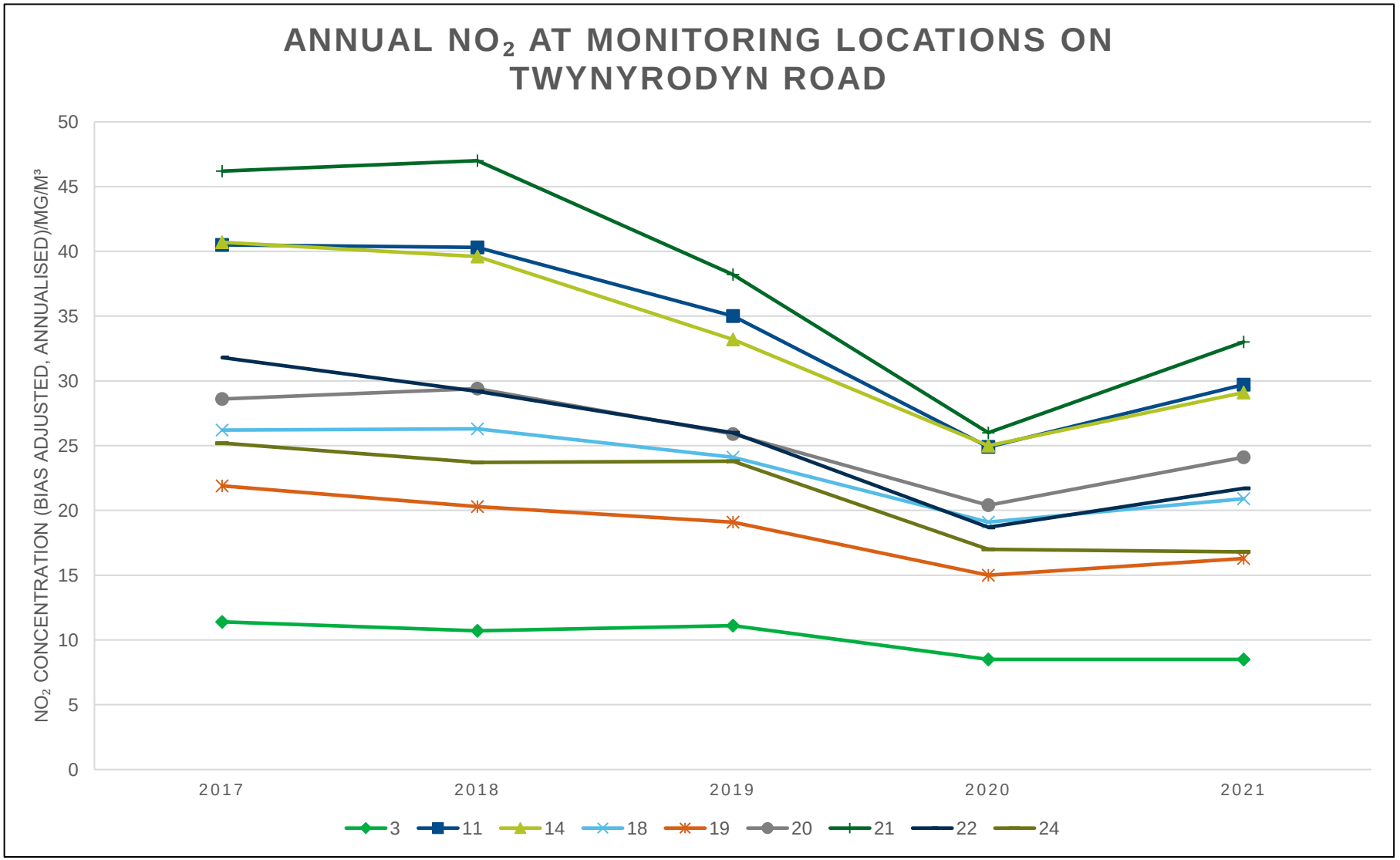


Figure 2.7 – Trends in Annual Mean NO_2 Concentrations – monitoring locations within the AQMA

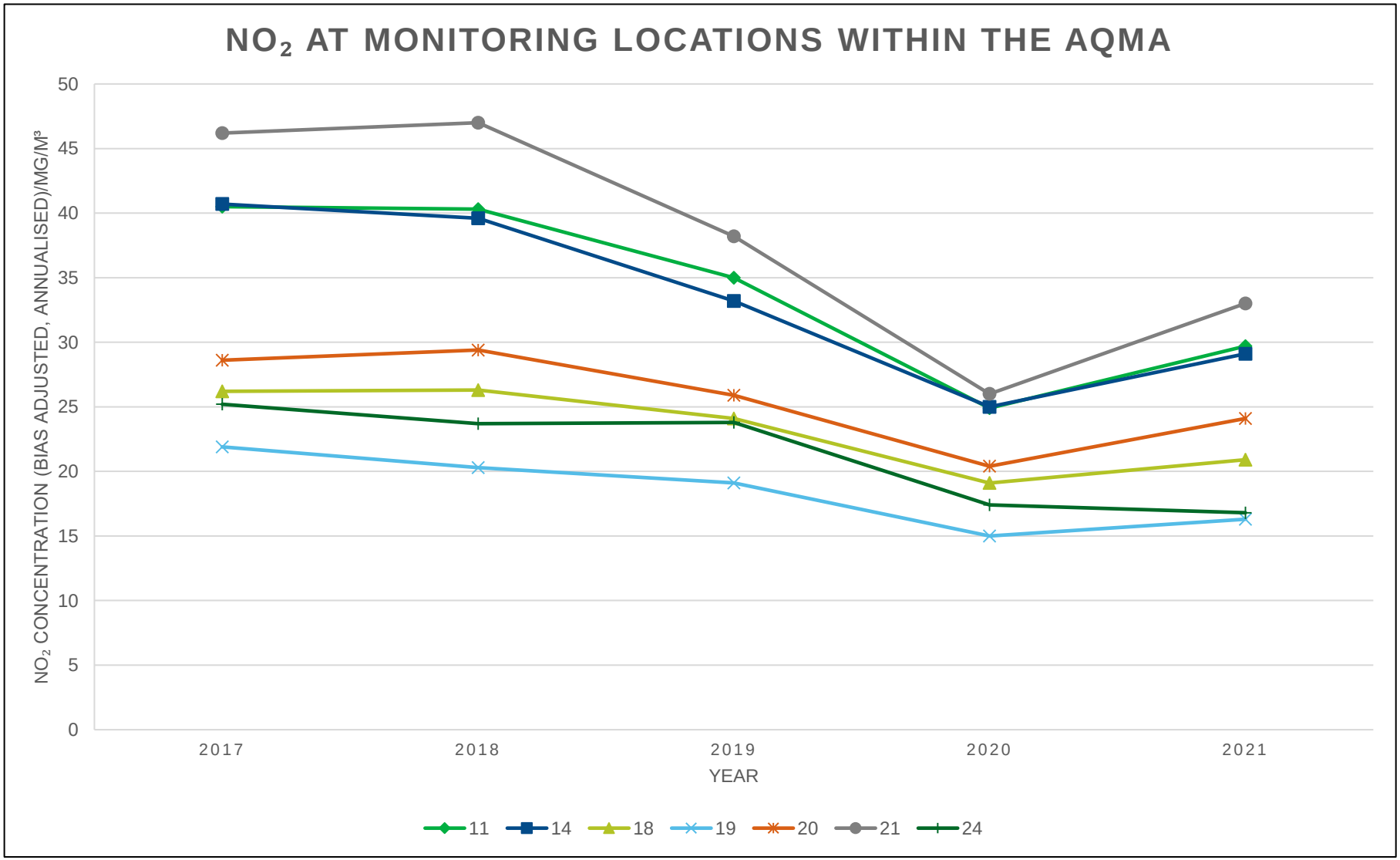


Figure 2.8 – Trends in Annual NO_2 Concentrations – monitoring locations on streets surrounding the AQMA

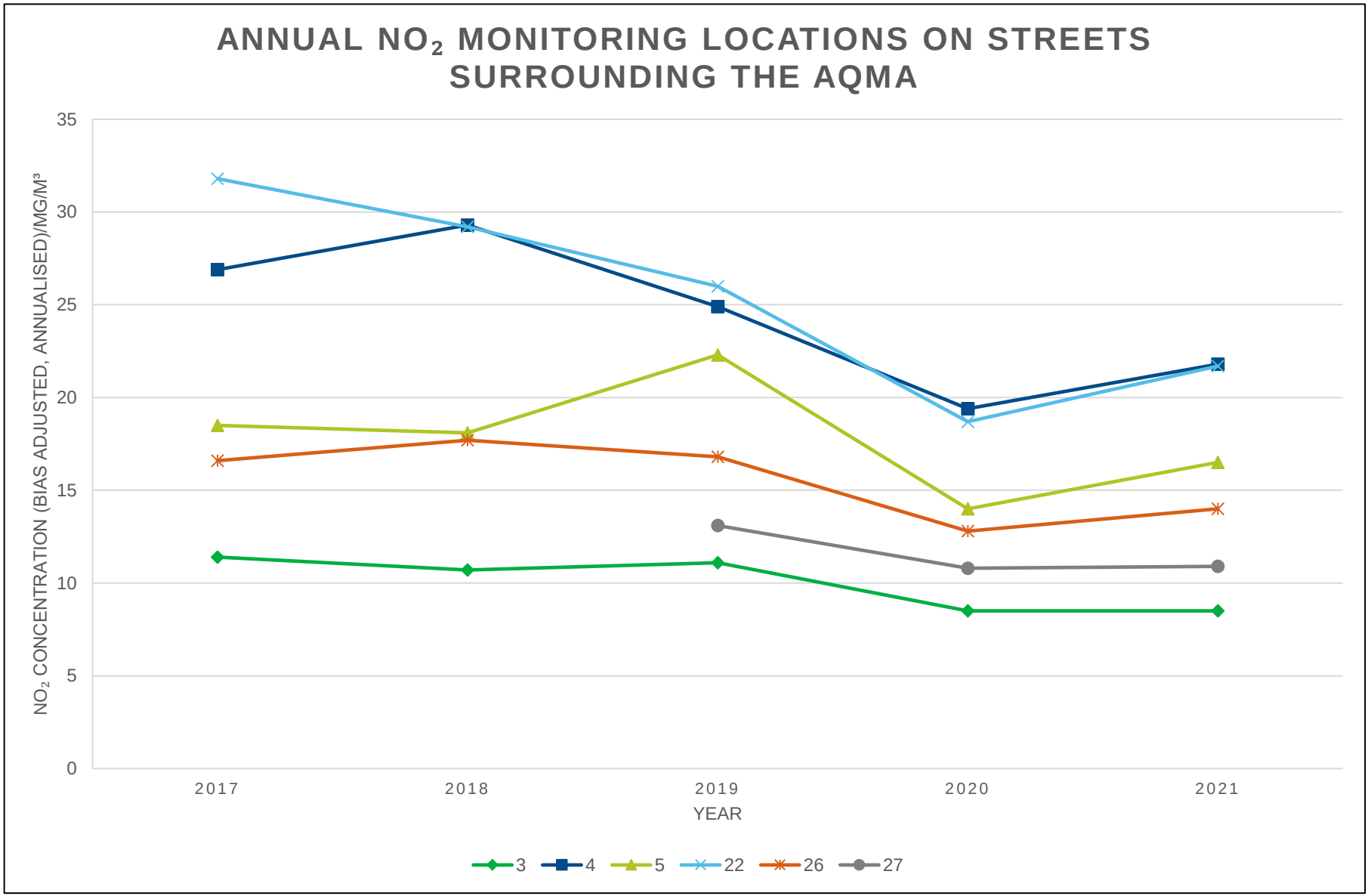


Table 2.4 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
ECC	Roadside	Automatic	4.9	4.9	**1(154.5)**	**1(153.7)**	0	0	-

Notes:

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

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 2.5 – Annual Mean PM_{10} Monitoring Results (µg/m^3) (Redundant method*)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
TEOM	Suburban	82	82	11.32	8.7	8.8	9.4	10.3*

Notes:

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

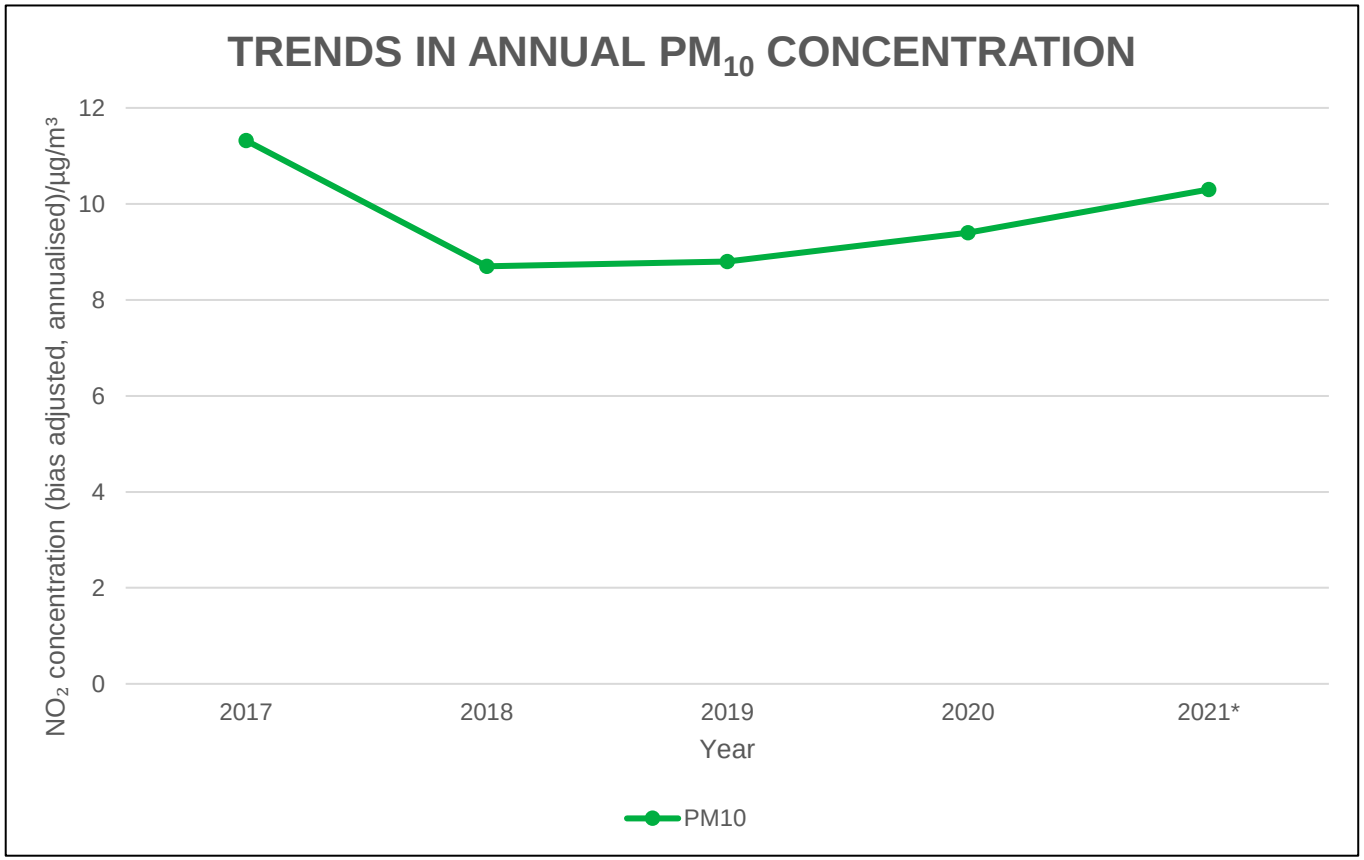
All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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%).

* Redundant correction method (see Appendix C)

Figure 2.9 – Trends in Annual Mean PM_{10} Concentrations



*Redundant correction method (see Appendix C)

Table 2.6 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3 (Redundant method*)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
TEOM	Suburban	82	82	0	0	0	0	0(19.3)*

Notes:

Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times/year) are shown in **bold**.

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%).

* Redundant correction method (see Appendix C)

Table 2.7 – $PM_{2.5}$ Monitoring Results (µg/m^3) (Redundant method*)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
TEOM	Suburban	75	75	4.47	4.5	4.42	3.8	5.6(1)*

Notes:

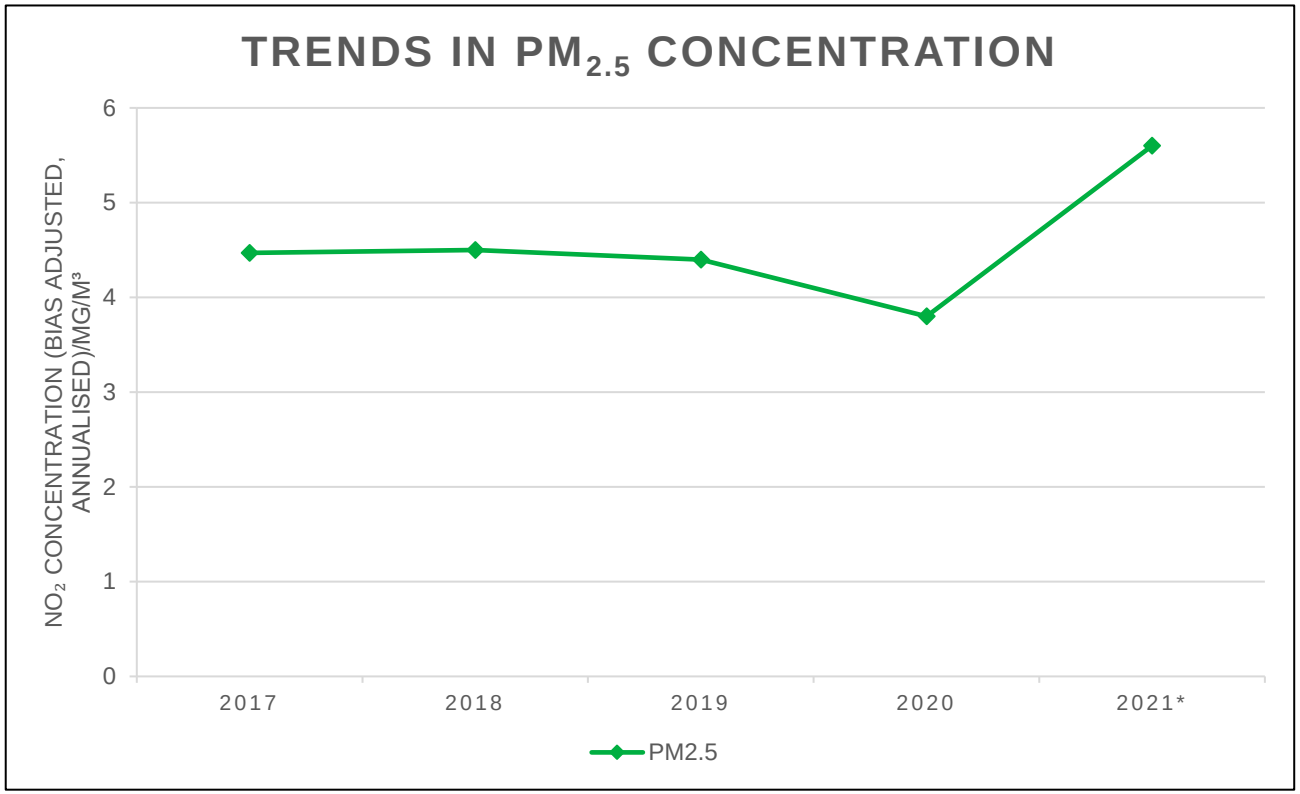
All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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%).

* Redundant correction method (see Appendix C)

Figure 2.10 – Trends in Annual Mean $PM_{2.5}$ Concentrations



* Redundant correction method (see Appendix C)

Comparison of 2021 Monitoring Results with Previous Years and the Air Quality Objectives

2.1.3 Nitrogen Dioxide (NO_2)

Generally, NO_2 concentrations have remained relatively stable over the previous 5 years with decreases in the last 3 as shown in Figure 2.3. The changes implemented from the action plan have shown a general decrease in NO_2 concentrations in the Twynyrodyn area with early indications from periods 6-12 of 2019 and periods 1-3 of 2020 (post traffic reversal and pre-pandemic) showing a good likelihood that levels would continue to reduce or at least remain stable and more than 10% below the ASQ objective. As reported previously, data for 2020 was anomalous due to the pandemic and associated lockdowns and as anticipated, this had a positive effect via abnormally low concentrations across the Borough as a whole. It was anticipated that levels would increase during 2021 and the data has revealed this to be the case however, all sites including those within the AQMA remain more than 10% below the AQS objective 40µg/m³. Due to prior indications that reductions in NO_2 would be sufficient to enable revocation of the AQMA, MTCBC intends to continue monitoring and is hopeful the AQMA can be revoked in 2023 or 2024.

Previous concern regarding diversions associated with the A465 dualling project initially created some bottlenecking of traffic through Dowlais High Street causing backing up of traffic some way down the road. Although reports were mainly concerned with the areas closer to the top of the hill approaching the Dowlais roundabout, the existing nearby monitoring location (Dowlais Upper – site 12, as shown in Table 2.2), data incoming through the year did not indicate concerning levels. Since this was highlighted, Future Valleys Construction have since constructed 2 smaller roundabouts in place of the much larger Dowlais roundabout which has improved flow of traffic somewhat. Overall concentrations for the Dowlais Upper monitoring site were 20.5µg/m³, significantly lower than the AQS objective.

Over previous years, the ECC monitor has been problematic but performed adequately during 2020. Unfortunately, the monitor was operational for only 4.9% of 2021 and therefore has not yielded valid data in terms of annual average or hourly concentrations. Data from previous years has shown the correlation to diffusion tube data to be good and due to the diffusion tube data showing concentrations at 98 Pontmorlais (the co-located

monitoring point) being 17.6µg/m³, there is no great concern regarding the need for co-location data at present. Due to unreliability of the ECC monitor, the Council intends to review use of the monitor going forward and to carry out research regarding alternative options if continued issues are experienced. Furthermore, it should be noted that the ECC is not an established technology and is not a recognised and standardised approach to measuring annual NO_2 levels, unlike a chemiluminescent monitor. It was chosen as a monitor as it is small enough to be attached to street furniture and by giving real time results, it can be used to see trends such as diurnal patterns and monitoring changes in patterns such as following road diversions including the reversal implemented under the action plan.

This is particularly important due to the nature of Pontmorlais High Street, which is a narrow street of retail units at ground floor level with a number of residential units at first and second floor level. Although a significant elevation in NO_2 levels has not been observed since the change in traffic flow direction and it is not anticipated to exceed the AQS objective, the presence of tall buildings in conjunction with the narrow street means there may be a canyon effect. At the time of writing, the monitor is operational and will be regularly checked to ensure any offline periods are kept to a minimum wherever possible. Once a sufficient amount of monitoring data is available for this area, the real world performance of the Fluidyn France modelling carried out in 2016 can be scrutinised.

Monitoring at the majority of the existing sites was for the full calendar year. Only 2 sites suffered any loss – 119 High Street corner and 5 Somerset Place, Union Street both yielded 83% data capture for the year. As such, it has not been necessary to annualise the data for these sites. Conversely, data capture for the 4 additional diffusion tubes was a maximum of 50% as the sites were established from period 7 onwards. There was some loss due to missing tubes however, Swan Street and Picton House, Swan Street each yielded 50% capture with High Street Chapel yielding 33% and Graham Way, River Walk yielding 42%. As such, it was necessary to annualise the data for all 4 sites to provide an indication of annual mean concentrations. Further information regarding the calculation for annualisation can be found in Appendix C.

As the ECC monitor performed for only 4.9% of the year, the data capture is below the lower threshold of 25% for annualisation to be required. It is worth noting however, that for the short time the monitor was active, it did not record any exceedances of the short-term 200µg/m³ and although this is not necessarily indicative of the remaining monitoring period, the co-located diffusion tube results are encouraging. Due to the extended periods

where the ECC monitor has not provided continuous monitoring of NO_2, the diffusion tube network is a more reliable method for long term monitoring and will continue to be the main approach taken by MTCBC.

Only 2 monitoring sites of the existing network recorded an increase in NO_2 concentrations during 2021 compared to 2019. These are Imperial Hotel, High Street and 110 High Street. The site at Imperial hotel was 25.9µg/m³ for 2021, compared to 23.1µg/m³ for 2019 and the site at 110 High Street was 23µg/m³ for 2021 compared to 21.7µg/m³ for 2019 (2020 data has been disregarded for this comparison). This correlates to the increase in traffic along the High Street following the traffic reversal however data for 98 Pontmorlais reduced from 18.3µg/m³ in 2019 to 17.6µg/m³ in 2021. Notwithstanding, the 2 sites where concentrations have increased are still well below the AQS objective. For 2021, all diffusion tube sites are within the annual mean objective for NO_2 of 40µg/m³ and currently, none of the sites are within 10% of the AQS objective. Continued monitoring of the existing network to collect a longer-term data set will be carried out.

2.1.4 Particulate Matter (PM_{10})

PM_{10} and $PM_{2.5}$ are monitored by Merthyr (South Wales) Ltd as a planning condition for the Ffos-y-Fran land reclamation scheme, an opencast reclamation scheme which began operations in 2007. They operate the TEOM at Twynyrodyn Community Primary School. PM_{10} was reducing, but in 2017 increased, with 2018 and 2019 reducing in line with previous years. The monitor is maintained and serviced by EnviroTech on an annual basis. There was a marginal increase through 2020, but not to the extent of 2017.

*****Data for 2021 shows an increase in PM_{10} concentrations with an average mean of 10.3µg/m³ compared to 9.4µg/m³ in 2020. The AQS objective for PM_{10} is a maximum of 40µg/m³ for annual mean concentrations and 50µg/m³, not to be exceeded more than 35 times per year, the latter being applicable to 24 hour mean periods (See Appendix B). More than 85% annual data broken down into 24 hour averages is required in order to report on the number of exceedances of the 24 hour mean objective of 50 µg/m³. As there was only 82% valid data capture, it has been necessary to report the 90.4th percentile. If the 90.4th percentile is greater than 50µg/m³, this indicates the objective has been breached. The 90.4th percentile for 2021 data was 19.3µg/m³.

***It must be emphasised that the results for 2021 are only an indication and as such, no significant conclusions can be read into the data due to an issue with the**

method of data correction. This is explained in Appendix C: Air Quality Monitoring Data QA/QC (p.68).

2.1.5 Particulate Matter ($PM_{2.5}$)

$PM_{2.5}$ was reducing, but in 2017 it had increased, following the same pattern as PM_{10}. It remained at a similar level in 2018 and 2019 but had decreased slightly. In 2020 the annual mean concentration of $PM_{2.5}$ had further reduced to 3.8µg/m³. There was 75% valid data capture for 2021 and has shown an increase in annual mean concentrations to 5.6µg/m³ for 2021 (Table 2.7). **It is important to note, that as for PM_{10}, the $PM_{2.5}$ monitoring results are only an indication due to issues with data correction (see Appendix C).**

Summary of Compliance with AQS Objectives as of 2021

MTCBC has examined the results from monitoring in the Borough. Concentrations are all below the Objectives however, more monitoring is required to ensure the levels of NO_2 remain below the objectives and do not increase to fall within 10% of the AQS objective, to consider revoking the AQMA.

3 New Local Developments

At this time, there is one new development which required an air quality assessment since the previous Air Quality Progress Report. The Environmental Health Department is aware of planned developments through consultation on the planning process and the Local Development Plan. Presently, MTCBC is embarking on a 15-year plan which covers residential accommodation, public transport and active travel in and around the town centre.

Twynyrodyn – Residential Housing Development

The proposed development includes the construction of 121 dwellings, consisting of a mixture of detached, semi-detached and terraced housing of 2, 3 and 4 bed design. The plans for the development include installation of car charging infrastructure and car charging points for all dwellings. It is anticipated that government targets to cease production of new petrol and diesel cars by 2030 will generate a shift toward the use of electric and hybrid vehicles. This, in conjunction with improved emissions technologies for new petrol and diesel vehicles still being produced should mean that overall, numbers of older petrol and diesel vehicles will gradually diminish, resulting in a reduction of NO_2 concentrations from road traffic sources. Additionally, new active travel routes have been designed into the development to link in with existing routes. A copy of the air quality assessment and associated plans can be viewed at: https://publicaccess.merthyr.gov.uk/online-applications/ (ref: P/21/0358)

Road Traffic Sources (and Other Transport)

Twynyrodyn Road

As identified in previous reports and the Detailed Assessment in 2015, Twynyrodyn Road is a narrow, busy street with residential properties close to the kerb and remains the location of an AQMA. Despite an interruption to typical data for the area due to the pandemic, ongoing monitoring as circumstances reflect more of those pre-pandemic is demonstrating that the traffic reversal measures implemented have had a positive impact on Twynyrodyn Road. All sites along Twynyrodyn Road are now >10% below the AQS objective and no exceedances are anticipated. The highest concentration of NO_2 recorded

along Twynyrodyn Road was 33µg/m³ at the 51 Twynyrodyn Road monitoring site, 18% below the AQS objective.

NO_2 monitoring stations along Pontmorlais High Street and many of the NO_2 stations along Twynyrodyn Road have been retained to determine whether the reversal has had the predicted effect. Monitoring through 2021 has further demonstrated that the reversal has been effective. Additionally, 5 tubes were relocated from the network to provide additional monitoring on Union Street, Darren View, High Street, Pontmorlais High Street and Penydarren Road. The first 2 tubes are to monitor for changes caused by people taking back routes to avoid the traffic reversal and the remaining 3 are to monitor the reversal route for any potential breaches of the NO_2 annual mean air quality standard (40µg/m³). Data for 2021 showed concentrations at Union Street and Darren View as 10.9µg/m³ and 14.6µg/m³ respectively. Additionally, the 3 tubes along Pontmorlais High Street, 98 Pontmorlais High Street, 110 Pontmorlais High Street and 119 Pontmorlais High Street showed concentrations of 17.6µg/m³, 23µg/m³ and 17.3µg/m³ respectively. Pontmorlais High Street has a number of tall buildings and is a relatively narrow road (11.3m between buildings on opposite sides of the road) and there is the potential for a canyon effect. Modelling indicated this would not result in a breach of the NO_2 annual mean AQS objective however, the captured data is vital in terms of assessing real-world performance. The ECC was also moved to Pontmorlais High Street in February 2019 to allow real-time monitoring of the effect on air quality along Pontmorlais High Street. Although there was insufficient data capture for 2021, data from 2019 post-period 6 (following implementation of the traffic reversal and prior to the pandemic) was encouraging.

Avenue de Clichy

Following implementation of the traffic reversal, there was some public concern regarding increased concentrations along Avenue de Clichy due to increased congestion. A build up of traffic along Avenue de Clichy was thought unlikely to be of public health concern as the west side of the street is bounded by the River Taff making canyon effects unlikely. On the east side there are a small number of residential flats set back from the road by at least 6.5m, which is a sufficient distance that any deterioration in air quality will remain well below the air quality objective. To provide reassurance that the modelling was correct, a diffusion tube was installed at Caedraw Flats, just off the Avenue de Clichy in August 2019. 2021 yielded 100% data capture at this monitoring location with an average mean concentration of 17.4µg/m³, well below the AQS objective of 40µg/m³.

Merthyr Tydfil Bus Interchange Development

As described in the previous annual report, the Merthyr Tydfil Bus Interchange Development became operational in June 2021. Since then, 4 additional diffusion tubes were added to the monitoring network to assess the effect of the new located station on NO_2 concentrations. Previous monitoring and modelled data did not indicate concerning predicted levels and the diffusion tube data so far appears encouraging and therefore there are no plans to introduce any measures at present to reduce concentrations. As the tubes were installed mid-2021, capture at the new sites has been between 33% and 50%, the former reduction due to missing tubes. As the data capture for the year was less than 85% but more than 25%, it has been necessary to annualise the results (see Appendix C – Air Quality Monitoring QA/QC). Following annualisation and bias adjustment of the data, the concentrations have not been concerning thus far. The highest concentration of the additional monitoring sites was 19.6 µg/m³ at Swan Street and the lowest was 11.8µg/m³ at Graham Way, River Walk.

Roads with significantly changed traffic flows

A465 Heads of the Valleys and Surrounding Roads

The project to convert sections of the A465 Heads of the Valleys Road to dual carriageway continues, with work having commenced on the project in May 2021. The works are anticipated to be completed around mid-2025. The works have resulted in slowed traffic on the A465 through speed limit reductions and lane closures and diversions are in place. Concentrations through Dowlais were monitored closely due to concern raised as a result of an increase in traffic queues through Dowlais however, levels have not reached concerning levels. Additionally, the construction of 2 smaller roundabouts in place of the much larger Dowlais roundabout have improved traffic flow as it has reduced the speed at which vehicles were previously travelling, which allows greater opportunity for waiting traffic to enter onto the smaller roundabouts.

Traffic has increased on the A470 where diversions will join at Rhyd-y-car and by Cyfarthfa Retail Park to re-join the A465 at Cefn Coed. It is likely that during such diversions, NO_2 will increase along the diversionary routes. As this will be temporary, MTCBC are not considering any actions to reduce NO_2 in the affected areas for the time being. Different diversions are predicted to last up to 6 months. This policy of no action

will be reviewed if diversions and consequent deterioration in air quality are more significant or of longer duration than expected.

MTCBC holds monthly meetings with the lead contractor Future Valleys Construction (FVC) in order to maintain an overview of progress and to discuss any complaints or issues as they arise, in addition to discussion of any unforeseen works that may become necessary.

Industrial / Fugitive or Uncontrolled Sources / Commercial Sources

Goat Mill Road, J0620 – Proposed plastic processing and recycling facility

The proposed development is currently in the planning phase and no decision has yet been made in respect of the application. An Air Quality assessment has been submitted as part of the planning application which indicates impacts on local air quality to be insignificant. Although the main effects to air quality would be a result of increased vehicle movements in relation to construction and operation of the site, MTCBC's Highways and Engineering department have commented that the current road network will sufficiently cope with the increased vehicle movements.

Should the development go ahead, the existing NO_2 monitoring network may be extended if found to be necessary, to assess concentrations around the vicinity of the site against those modelled in the supporting assessment.

The proposed development, which includes installation of a combined heat and power (CHP) plant would also require a permit to operate in accordance with the Environmental Permitting (England and Wales) Regulations 2016, which would be issued and regulated by Natural Resources Wales (NRW). Permits issued by NRW impose statutory limits on emissions to air, land and water.

A copy of the Air Quality assessment submitted as part of the application can be viewed at: https://publicaccess.merthyr.gov.uk/online-applications/ (ref: P/22/0064)

Vaynor Quarry

MTCBC is currently in receipt of a planning application to reinstate an historic planning permission to resume quarrying works and mineral extraction at the existing site, which has been mothballed since circa 2007 with works at the site being intermittent prior. The

earliest commencement of operations, providing permission is granted, would be 2023 however, it is likely to be further in the future. An Environmental Report has been submitted in respect of the application which considers a number of issues including air quality. The potential for adverse effects on air quality from the proposed development would be a result of process contribution and road traffic emissions associated with the site.

The air quality element of the Report includes a dust assessment for particulates in accordance with the IAQM (Institute for Air Quality Management) mineral dust guidance document. Additionally, modelling of road traffic emissions has been carried out using ADMS-Roads dispersion model (version 5.0.0.1). The Report also details operational and design measures to minimise dust emissions.

A copy of the Environmental Report submitted as part of the application can be viewed at: https://publicaccess.merthyr.gov.uk/online-applications/ (ref: P/22/0206)

Other Sources

Bonfires occur occasionally, both around the 5th November and in domestic gardens. As these occur on an isolated rather than continuous basis they are not considered likely to significantly affect air quality. Some properties have installed domestic wood burners. This is on a scattered and random basis throughout the borough. Due to the scattered nature it is not considered to have significantly affected air quality. It is however important to note that proposed legislative changes detailed in the Welsh Government's White Paper on a Clean Air (Wales) Bill may see a reduction in any contribution to higher levels of pollutants as a result of solid fuel burning, if implemented.

MTCBC has identified the following new or previously unidentified local developments which may impact on air quality in the Local Authority area:

- Twynyrodyn – housing development (see p.45)
- Goat Mill Road – plastic processing and recycling plant (see p.48)
- Vaynor Quarry (see p.48)

Therefore MTCBC will need further consider the implications to local air quality arising from the developments.

4 Policies and Strategies Affecting Airborne Pollution

4.1 Local / Regional Air Quality Strategy

MTCBC have an informal strategy of addressing air quality. A network of diffusion tubes and real time monitoring is used to assess air quality and to produce the required annual reports. Changes to the traffic network are regularly considered including whether these necessitate a change to the air quality monitoring network. MTCBC have taken steps to improve air quality by carrying out the traffic reversal on Pontmorlais High Street and Church Street as identified in the AQMA action plan.

The Environmental Health Department previously considered drawing up a written local air quality strategy to formalise the current approach. Although this not yet complete, the strategy will be finalised pending the outcome of the Clean Air Plan for Wales which proposes a new Clean Air Act for Wales. Once produced, it will be made available to the public on the MTCBC website.

4.2 Air Quality Planning Policies

The Local Development Plan 2016-2031 was adopted in January 2020. Environmental Health provided comments on candidate sites, including their potential to impact air quality. Development includes a small increase in industrial and commercial sites and a significant increase in residential sites, in particular a substantial housing development on the former Hoover site. The size of the site means that although increased residential use will affect air quality, it offers sustainable travel options being large enough to accommodate a Metro and/or Park and Ride facility. The size of modern properties in conjunction with the requirements for roadways and parking, mean canyon effects are unlikely therefore offering residents a degree of protection. As it is likely to be developed in phases by a large-scale single developer, this will allow mitigation measures to be considered during the planning process.

Also identified was the conversion of former offices to residential flats, within the town centre. Depending on the location, this may necessitate an expansion of the air quality monitoring network however, as the town centre is substantially pedestrianised or otherwise restricted, the air quality impact is not considered to be a major factor.

The Environmental Health Department has considered the Special Planning Guidance produced by various councils and is considering producing a SPG to require mitigation measures to offset some of the deterioration in air quality caused by increased residential use, particularly the introduction of domestic vehicles to an area. This will be explored further when a local air quality strategy is formalised. It should be noted however, that the increasing use of electric vehicles in addition to improved emissions technologies for new petrol and diesel vehicles is likely to produce an incrementally positive effect on emissions. The extent of this will depend on available infrastructure for charging as well as economic ability.

4.3 Local Transport Plans and Strategies

MTCBC's local transport plan is a part of the South East Valleys Local Transport Plan, with 4 other councils. These areas make up the capital city region in that they are within commuting distance of Cardiff.

The plan focusses on economic growth by improving commuting to Cardiff and Newport, and transport to encourage economic growth in other areas, social inclusion through providing transport to disadvantaged areas and improving environmental quality through safer, healthier and sustainable travel.

The plan considers various other related documents including the Wales Transport Strategy 2021 and the Active Travel (Wales) Act 2013. It incorporates the Cardiff Capital Region Metro, a plan to link various modes of transport to improve connectivity between Cardiff and the South East Valleys.

The aim is to offer other modes of transport than driving such as active travel (walking and cycling), regional rail and buses as well as highway improvements to ease congestion and assist in freight transport. Aims include integrating active travel and public transport to offer multi-modal alternatives to the car.

To carry out the aims of the LTP, MTCBC is expected to seek funding through sources including the private sector and Welsh Government funds. Under the LTP, MTCBC has developed the new bus interchange, now operational and will be providing, in conjunction with Transport For Wales a railway Park and Ride scheme serving Pentrebach station, improved pedestrian and cycle access to Merthyr College and Cyfarthfa Retail Park and to improve the Taff Trail for active travel. Additionally, the LTP covers the dualling of the

A465 Heads of the Valleys Road to improve West-East routes between the South East Wales Valleys, which is in the construction phase.

4.4 Active Travel Plans and Strategies

Active travel aims to improve access for walking, including the use of mobility scooters and cycling. It addresses routes to schools, workplaces, shops and services such as healthcare and leisure. It does not address walking or cycling for recreational purposes. MTCBC has improved various walking and cycling routes. Within the next 5 years, new routes will be developed and in 5 or more years, routes will be developed or improved subject to feasibility studies.

Expansion of active travel routes such as additional cycle tracks, maintenance of existing routes and improved infrastructure in favour of active travel aims to further improve car-less travel by way of improved connectivity with the new multi-modal, integrated transport network for the heads of the valleys and capital region. Part of this network is the new bus interchange which is located close to the proposed metro station. Works to the Merthyr Tydfil section of the rail line have now commenced.

The River Walk crossing has been upgraded to improve pedestrian access links between the college and the town. A new crossing has also been installed at Lower High Street in conjunction with widening of footpaths in order to make the route into the town from the south end more pedestrian-friendly to therefore encourage more people to walk.

It is aimed at encouraging healthier lifestyles and reducing the negative impacts of traffic on neighbourhoods and communities. The aim of improving the active travel routes is to encourage people to swap from car journeys to active travel methods. By reducing the number of journeys made by car, in particular short journeys, where car engines have little time to warm up and perform efficiently, air quality should improve.

4.5 Local Authorities Well-being Objectives

Air pollution is considered in the well-being objectives, specifically in relation to the Twynyrodyn AQMA. There are 4 key areas of well-being: Best start to life; working life; environmental well-being; and living well. Implementation of the action plan to address the Twynyrodyn Road AQMA is a key performance indicator in environmental well-being and a specific project for working life. This is in addition to how air quality and congestion affects people's perception of the area and can slow journeys to work.

The key performance indicator set is that air quality along Twynyrodyn Road, should remain >10% below the AQS objective for NO_2. The Environmental Health Department reports on progress towards this performance indicator at scrutiny meetings. Since the traffic reversal on 28th May 2019 and despite anomalous data for much of 2020, data for 2021 has shown that all sites along Twynyrodyn Road have remained >10% below the AQS objective for NO_2.

4.6 Green Infrastructure Plans and Strategies

MTCBC does not currently have a Green Infrastructure Strategy. Green infrastructure has however, been considered in the Local Development Plan and may need formalising into a strategy in the near future.

4.7 Climate Change Strategies

The well-being objectives include the need to limit climate change. Low carbon usage contributes towards the objectives of a prosperous Wales and a resilient Wales. The well-being objectives for MTCBC include, under 'environmental well-being', the key performance indicator of carbon management of local authority buildings and fleet. Carbon dioxide emissions from local authority buildings reduced from 2016/2017 to 2018/2019 and there are targets to reduce emissions further. This is in order to comply with Welsh Government's plan for the Welsh Public Sector to be carbon neutral by 2030. Current work includes feasibility studies for solar farms within the county borough. Additionally, the Clean Air Bill for Wales proposes to lower AQS objectives for key pollutants.

5 Conclusion and Proposed Actions

5.1 Conclusions from New Monitoring Data

Data for 2019 following implementation of the traffic flow reversal (post-period 6) showed a decrease in levels of NO_2 within the AQMA. All sites but one within the AQMA were >10% below the AQS objective, with the monitoring location at 51 Twynyrodyn Road being the only site which although was below the AQS objective, remained within 10% of it. This may have been attributable to periods 1-6 providing data for pre-traffic flow reversal, which were similar to years 2016, 2017 and 2018 where the AQS objective was exceeded each year respectively. As such, it was anticipated that once a whole year of typical data was obtained, the limit for 51 Twynyrodyn Road would fall to >10% below the AQS objective over the following year. Annual levels of NO_2 within the AQMA for all other monitoring locations fell well below the AQS objective during 2020. The reduction was expected due to the pandemic as mentioned previously however, due to the reduction during the second half of 2019, it was expected to remain below the AQS objective going forward. 2021 data has indeed shown that the NO_2 concentration for 51 Twynyrodyn Road being 33µg/m³ has now reduced to >10% below the AQS objective.

Legacy impacts of the pandemic appear to have created some beneficial effects on air quality in terms of changes to ways of working and increased home-working, resulting in fewer car journeys. On this basis, the AQMA will remain in place and monitoring will continue to obtain a sufficiently longer-term dataset from which future decisions regarding the AQMA can be made.

Previous reports highlighted congestion and year on year exceedances of the NO_2 AQS objective from 2016 to 2018 at 6/7 Ladysmith Place attributable to bottlenecks associated with dropping off and picking up at Troedyrhiw Community Primary School, although it did not exceed the AQS objective in 2019. Indications from the data following implementation of a temporary one-way system in 2019 suggested the improved traffic flow had reduced the level of NO_2. NO_2 concentrations for 6/7 Ladysmith Place for 2021 were 28.8µg/m³. As such, no actions are currently being considered for this location however, should continued monitoring indicate an increase in levels to within 10% of the AQS objective, actions may then be considered.

5.2 Conclusions relating to New Local Developments

The development of most concern in terms of air quality is the continuing dualling of the A465 and its associated diversions. The works are scheduled for completion in 2025, with a number of diversions in place for the duration, some of which may be in place for a number of months. Areas likely to be affected are Dowlais, Twynyrodyn, Town Centre with congestion expected at Cyfarthfa Retail Park and Park/Trago Mills roundabout.

The impact on air quality may be unavoidable as the scheme has been assessed as necessary for the long-term well-being of Wales and will ultimately benefit the Merthyr Tydfil County Borough. As any negative effect will be temporary, it is not considered necessary to take action at this time. This will be reviewed if any diversions remain in prolonged use, the data indicates exceptionally high levels of NO_2 or if the public raise health concerns that warrant investigation.

5.3 Other Conclusions

As discussed earlier in this report, further monitoring is necessary to assess the longer-term effectiveness of the implemented measures in accordance with the Action Plan in relation to the existing AQMA, although data for 2021 demonstrating all sites within the Borough being >10% below the AQS objective is highly encouraging. MTCBC aims to obtain sufficient longer-term data in this respect before considering revocation of the AQMA. Once revocation of the AQMA is feasible, consultation will be carried out to ensure there is minimal possibility that a further AQMA would need to be declared again in the Twynyrodyn area.

In the long term, the focus of the Local Transport Plan on providing alternatives to using cars should contribute to improved air quality. Similarly, improvements to the existing vehicle fleet as older vehicles are replaced and additionally, the increase in use of electric vehicles and improved emissions technologies to new petrol and diesel vehicles should also contribute to improved air quality.

The Environmental Health Department will continue to monitor air quality and will look to produce an air quality strategy and are considering special planning guidance around air quality.

5.4 Proposed Actions

The following actions are proposed to address air quality:

- No new AQMAs will be declared in 2021.
- The existing AQMA will not be revoked at this time because although the annual mean NO_2 concentration within the AQMA for 2019 was below the AQS objective, it remained within 10% of the objective at 51 Twynyrodyn Road. Due to the anomalous data for 2020, MTCBC currently has only one full year of valid data. Therefore, ongoing monitoring is required to evidence longer-term trends, to consider revocation.
- Monthly monitoring data to date from 6/7 Ladysmith Place indicates that although bottle necks exist, the NO_2 concentrations at the site remain within the AQS objective. The additional monitoring location at 37 Brookfield Terrace has to date not shown any concerning concentrations, but will remain in place for the foreseeable.
- Four new diffusion tubes have been installed around the vicinity of the new bus interchange and will remain in place for at least 3 years. Should concentrations of NO_2 reach concerning levels, action may be considered in any future action plan.
- NO_2 concentrations at monitoring locations near diversions associated with the dualling of the A465 will be closely monitored as the scheme progresses and the Environmental Health Department meets regularly with the Future Valleys Construction, the main contractor overseeing the scheme.
- Research into establishing an alternative to the TEOM, with equipment which is equivalent to the reference method.
- Work will continue on a local Air Quality Strategy.

References

Title	Author	Date
Prince Charles Hospital, Merthyr Tydfil Detailed Assessment of Air Quality	AEA for MTCBC	2011
Particulate Measurement at Twynyrodyn Primary School site – 2020 data	Merthyr (Ffos-y-Fran) Ltd	2020
Detailed Assessment of Air Quality at Twynyrodyn Road, Merthyr Tydfil	AQC for MTCBC	2009
South East Valleys Local Transport Plan	Blaenau Gwent CBC; Caerphilly CBC; Merthyr Tydfil CBC; Rhondda Cynon Taff CBC; and Torfaen CBC	2015
Local Air Quality Management – Technical Guidance LAQM (TG16)	DEFRA	2021
National Diffusion Tube Bias Adjustment Factor Spreadsheet (06/21)	DEFRA	2021
PM_{10} Volatile Correction Model	King's College London	2012
LAQM Helpdesk March 2021: Summary of laboratory performance in AIR NO_2 proficiency testing scheme January 2019 – March 2021	LAQM	2021
First Stage Review and Assessment	MTCBC	1998
Second Stage Review and Assessment	MTCBC	2000
Progress Report	MTCBC	2004

Updating and Screening Assessment	MTCBC	2004
Progress Report	MTCBC	2005
Updating and Screening Assessment	MTCBC	2006
Progress Report	MTCBC	2007
Progress Report	MTCBC	2008
Updating and Screening Assessment	MTCBC	2009
Progress Report	MTCBC	2010
Progress Report	MTCBC	2011
Updating and Screening Assessment	MTCBC	2012
Progress Report	MTCBC	2013
Progress Report	MTCBC	2014
Detailed Assessment of Air Quality at Twynyrodyn Road, Merthyr Tydfil	MTCBC	2015
Updating and Screening Assessment	MTCBC	2015
Progress Report	MTCBC	2016
Progress Report	MTCBC	2017
Annual Progress Report	MTCBC	2018
Annual Progress Report	MTCBC	2019
Annual Progress Report	MTCBC	2020
First Replacement Local Development Plan 2016-2031	MTCBC	2018
Focus on the Future: Wellbeing in our Community 2017-2022	MTCBC	2018

Wellbeing of Future Generations (Wales) Act 2015	Welsh Government	2015
Metro: Rolling out our Metro	Welsh Government	
A New Wales Transport Strategy: 2021	Welsh Government	2021

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 A.1 – Full Monthly Diffusion Tube Results for 2021 (µg/m^3)

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.78) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
1	44.5	31.4	31.2	29.8	28.2	24.8	28.1	34.1	35.3	32.4	41.6	37.1	33.2	25.9	25.9
2	22.9	19	11.6	15.4	14.4	11	11	15	14.9	18	20.3	17.9	16.0	12.4	12.4
3	16.5	13.3	11.2	11.5	7.9	7.3	3.5	12.2	10.1	11.8	12.0	13.1	10.9	8.5	8.5
4	31.7	30.5	25	26.2	25.5	19.6	18.3	32.0	29.0	28.8	35.6	33.2	28.0	21.8	21.8
5	28	19.5	22.8	18.9	17.2	14.7	15.3	19.1	22.5	24	26.9	25.2	21.2	16.5	16.5
6	32.3	26.4	25.6	25.2	22.4	17.4	20.3	22	26.8	28.6	35.1	24.7	25.6	19.9	19.9
7	25.7	22	15.9	15.4	14.1	12.8	11.3	17.4	16.9	20.1	23.1	18.8	17.8	13.9	13.9
8	30.9	22.3	19.9	21.5	15.5	15.6	12	18.3	17.9	20.3	24	14.1	19.4	15.1	15.1
9	17.5	13.9	7.5	9.5	5.5	5.1	5.2	9.8	7.2	7.6	14.8	17.9	10.1	7.9	7.9
10	44.5	34.6	33.8	32	35.2	26.7	31.7	42.9	36.6	39	43.5	42.3	36.9	28.8	28.8
11	43.8	33	35.2	39.4	27.4	33.2	33.8	43.1	42.7	39	45.1	40.5	38	29.7	29.7
12	23.9	30.3	24.2	31.1	22.7	19.5	25.8	34.7	27.1	27.1	32.3	25.1	27	21	21
13	33.7	25.6	28.1	26.4	27.4	23.4	26.7	27.5	31.3	32.1	38.6	33.3	29.5	23	23
14	44.4	33.9	34.7	39.8	29.3	31.1	32.5	40.8	40.1	33.7	48.9	40.2	37.4	29.1	29.4
15	21.1	14.9	12.4	10.5	9.9	7.5	9	11.3	12.6	13.1	17.3	16.1	13	10.1	10.1
16	18.5	14.3	11.8	11.9	9.5	8.3	8.6	11.8	14.4	13.6	16.2	15.7	12.9	10	10
17	29.2	20.8	20.3		17.5	14.5	15.7	19.2		27.1	31	26.6	22.2	17.3	17.3
18	31.3	27.9	27.8	26.6	23.3	20.8	21.5	25.6	27.3	29	32.5	28	26.8	20.9	20.9
19	28.6	23.6	19.4	19.2	16.2	14.8	17.1	19.1	18.5	23.6	27.6	22.9	20.9	16.3	16.3
20	30	32	28.2	35.6	27.1	22.9	25.1	36.3	34.2	30.5	37.4	32	30.9	24.1	24.1
21	47.2	37.8	39.8	44	35.6	35.2	32.9	47.2	48	38.3	59		42.3	33	33
22	31.6	23.9	23.9	23.8	27	18.8	22.8	29.4	31.5	34.1	32.9	34.4	27.8	21.7	21.7
23	28.5	25.4	19.3	22.5	18.1	15.7	16.6	26.2	22.2	23	28.4	24.4	22.5	17.6	17.6
24	26.6	23.9	18.9	19.9	19.6	14.5	16.3	22.6	22.3	23	25.1	25.7	21.5	16.8	16.8
25	29.3	29.5	30.5	28.7	26.4	24.4	26	27.1	32.3	33.5	38.8	36.4	30.2	23.6	23.6
26	24.9	23	18	17.7	15.2	10.9	10.6	17.7	16.4	18.7	20.5	22	18	14	14
27	21.8	14.7	12.8	12.4			8.1	12.3	11.8	13.5	16	16.6	14	10.9	10.9

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.78) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
28	23.3	18.7	16.4	15.8	30.4	11	11.9	17	16	17.3	23.8	22.5	18.7	14.6	14.6
29	46.3	30.6	33.7	36.2	35.1	27.6	30.4	34.8	39.2	38.3	48.9	42	36.9	28.8	28.8
30	26.5	23.4	16.3	21.5	19.9	14.1	17.2	23.4	20.5	22.5	25.4	25.6	21.4	16.7	16.7
31	26.7	26.1	17.6	22.1	15.2	15.7	16.2	25.1	21.9	24.9	27.3	28.8	22.3	17.4	17.4
1a	-	-	-	-	-	-	14.5	24.6	24.8	27.2	29.2	26.9	24.5	19.6(1)	19.6
2a	-	-	-	-	-	-	12.9	16.1	17.7	20.5	23.3	21.4	18.7	14.9(1)	14.9
3a	-	-	-	-	-	-			15.2	19.3	20.9	22.2	19.4	14.1(1)	14.1
4a	-	-	-	-	-	-	9.5	12.9	13.8	16	19.2		14.3	11.8(1)	11.8

Notes:

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

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

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

(2) Distance corrected to 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 B.1.

The table shows the objectives in units of micrograms 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 B.1 – 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 tubes were manufactured and analysed by Socotec. The absorbant is analysed for NO_2 concentration using 50% TEA in acetone. Diffusion tubes were kept and used in accordance with the manufacturer's instructions, and were left out for a minimum of 4 weeks.

Precision is the ability of a measurement to be consistently reproduced. Diffusion tubes are defined as having good precision when the coefficient of variation between triplicate tubes is <20% for 8 periods out of 12, and <10% overall. In 2021 good precision was found in 22 out of 25 co-location studies. As such the precision for the diffusion tubes used in Merthyr Tydfil County Borough in 2021 is likely to be reasonable.

Socotec UK are UKAS accredited and participate in the AIR PT NO_2 proficiency testing, an independent scheme supported by the Health and Safety Laboratory (HSL). It uses artificially spiked Palmes type diffusion tubes on a quarterly basis to determine a laboratory's analytical performance. Tubes are doped with a known amount of nitrate to determine accuracy, with at least two of the tubes being duplicates, to determine laboratory performance. A different mass of nitrate is used each quarter and reflects the typical analytical range encountered in NO_2 monitoring in the UK. From this a performance score (z-score) is generated based on deviation between the known concentration and the value measured by the laboratory. Laboratories with 19 out of 20 (95%), from 5 rounds of testing, z-scores of $\leq \pm 2$ provide satisfactory performance. From January 2021 to January 2022, Socotec for 97.5% of testing achieved z-scores within this range. This is above the threshold for a laboratory to be considered satisfactory and as such the results are regarded as satisfactory.

Diffusion tubes were installed according to the annually published Tube Monitoring Calendar available at https://laqm.defra.gov.uk/air-quality/air-quality-assessment/diffusion-tube-monitoring-calendar/ with the exception of periods 6 and 8, which were installed +2 days beyond the due date. Tubes may be installed up to 2 days before or after the due date and as such, this does not cause an issue with the dataset.

Diffusion Tube Annualisation

Due to the addition of 4 new diffusion tubes around the vicinity of the new bus interchange commencing from period 7 (sites 1a; 2a; 3a and 4a), data for the year has been less than 75% and therefore annualisation of the data was necessary.

Defra's 'Diffusion Tube Data Processing Tool' was used to calculate the annualisation, which is in accordance with Local Air Quality Management Technical Guidance (TG16), by selecting data from 4 nearby local authorities via the Tool with annual capture of >85%. In accordance with the Technical Guidance, the bias adjustment factor has also been applied to the annualised data, which are presented in **Table C.2.**

Diffusion Tube Bias Adjustment Factors

Diffusion tubes may systematically under or over-read NO_2 concentrations compared to a chemiluminescent analyser. This is known as bias and can be adjusted for using a suitable bias adjustment factor. Applying a bias adjustment factor improves the accuracy of the data. Merthyr Tydfil County Borough Council does not undertake any co-location studies and as such, applies a National bias adjustment factor.

The national bias adjustment factor of 0.78 has been applied to the 2021 monitoring data and was obtained from National Diffusion Tube Bias Adjustment Factor Spreadsheet: Spreadsheet Version Number: 06/22. This is the most up to date version of the spreadsheet at the time of writing and can be seen at: https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html. A summary of bias adjustment factors used by Merthyr Tydfil County Borough Council over the past five years is presented in Table C.1.

A National Bias Adjustment Factor has been used for the following reasons:

- There are currently no co-location studies undertaken in accordance with best practice in Merthyr Tydfil County Borough.
- The sites listed in the Bias Adjustment Factor spreadsheet are in generally comparable locations and;
- The diffusion tube mean concentrations measured at significant Merthyr sites are within the range of results obtained from the specified national co-location sites.

Although there are general similarities between the sites, there are also some significant differences. The derived bias adjustment factor is therefore used with a degree of caution.

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	National	06/22	**0.78**
2020	National	06/21	0.76
2019	National	06/20	0.75
2018	National	09/19	0.76
2017	National	06/18	0.77

NO_2 Fall-off with Distance from the Road

No diffusion tube NO_2 monitoring locations within Merthyr Tydfil County Borough Council area required distance correction during 2021.

QA/QC of Automatic Monitoring

The ECC is manufactured by ACOEM UK (previously known as Air Monitors UK). The model is the AQMesh Pod. It was first produced in 2013 and has been subject to regular upgrades to improve performance.

The ECC was tested and calibrated by the manufacturer in September 2021 following an extended time offline. Unfortunately, following this work, the monitor again went offline however this has since been resolved. In laboratory conditions accuracy is +5ppb. It is designed with a sensor life and battery life of 2 years. After 2 years the battery and sensor should be replaced, which was carried out during servicing and calibration. It has also been discovered recently that the sensors can fail in cold, damp conditions and this should be checked for to enable fast replacement and to minimise data loss.

Colocation studies have been carried out against reference methods such as the chemiluminescent monitor. The correlations are variable, with v4.2 in 3 trials giving correlation of 0.70, 0.81 and 0.89. This shows the device should be used for indications of variations in NO_2, rather than as an accurate NO_2 concentration.

Once installed on site there is a short period of stabilisation as the ECC adjusts to environmental conditions. During the 2-year lifespan of the sensors and battery no further calibration is required. Performance may be affected after 2 years.

When re-installed in 2016 the device was co-located with 2 diffusion tubes and could be checked for significant differences. It was generally within 10% of diffusion tubes, with a tendency to under-read. Looking at the pattern between 2014 and 2018 with Tube 14 – 55 Twynyrodyn Road only it has fluctuated between over-reading by +14% and under-reading by -17%. In 2019 the ECC has over-read by around +14%. During 2020 the ECC, which was re-located to 98 Pontmorlais High Street on 11th February 2019, was operational for 79% of the year from periods 1 to 9 with fluctuations of over-reading by +6% to under-reading by -4%. Unfortunately, the monitor was non-operational for the majority of 2021 and no co-location data has been available on which to comment. On the basis of it not being the recognised continuous monitoring technique and its periods of prolonged downtime it is regarded as an indicator of temporal fluctuations. MTCBC will therefore continue to use bias adjusted diffusion tubes as the key mechanism for establishing the annual mean NO_2 concentration.

PM_{10} and $PM_{2.5}$ Monitoring Adjustment

Equivalence testing has shown that the TEOM can under-read possible losses of volatile material from the TEOM filter.

In previous years, data was corrected for the loss of volatiles by applying the King's College London Volatile Correction Model – a spreadsheet for Correction. The VCM takes FDMS purge measurements from the two nearest FDMS equipped TEOM analysers and an average of all the other FDMS purge measurements within 130km however, due to the gradual withdrawal of TEOM-FDMS instruments and phased replacement with new compliant PM monitoring equipment on the AURN (Automatic Urban and Rural Network), the extent of data available to maintain the VCM tool has significantly reduced in recent years. Although there was sufficient data available to apply a correction to the data for 2020, there is insufficient data for 2021 to enable correction via the VCM tool. For this reason, it has been necessary to apply the historic correction factor of 1.3. Although this method is considered redundant, it is currently the best method available for application to the TEOM data. It should be emphasised however that because the 1.3 correction factor is redundant, the concentrations and therefore comparison with previous years can only be considered as an indication and no significant conclusions can be read into the data.

Automatic Monitoring Annualisation

The ECC automatic monitor located at 98 Pontmorlais High Street recorded data capture or just 4.9% for 2021 therefore it was not required to annualise any monitoring data due to capture being below 25%.

NO_2 Fall-off with Distance from the Road

No automatic NO_2 monitoring locations within Merthyr Tydfil County Borough Council area required distance correction during 2021.

Table C.2 – Annualisation Summary (concentrations presented in µg/m^3)

Diffusion Tube ID	Annualisation Factor Caerphilly	Annualisation Factor Neath Port Talbot	Annualisation Factor Monmouthshire	Annualisation Factor Herefordshire	Average Annualisation Factor	Raw Data Simple Annual Mean (µg/m3)	Annualised Data Simple Annual Mean (µg/m3)
DT1a	1.0325	1.0066	0.9991	1.0519	1.0225	24.5	25.1
DT2a	1.0325	1.0066	0.9991	1.0519	1.0225	18.7	19.1
DT3a	1.0279	0.8824	0.9068	0.9052	0.9306	19.4	18.1
DT4a	1.0052	1.0635	1.0292	1.1368	1.0587	14.3	15.1

Appendix D: AQMA Boundary Maps

Figure D.1 –

N	**GRADDFA / SCALE:** 1:2,086
	DYDDIAD / DATE: 11/08/2020
	ADRAN / DEPARTMENT: Environmental Health
	ARLUNIWYD GAN / DRAWN BY: AR
TEITL / TITLE: Bryn Caerau Bungalow - Private Water Supply	

Cyngor Bwrdeistref Sirol
MERTHYR TUDFUL
MERTHYR TYDFIL
County Borough Council

https://airquality.gov.wales/laqm/air-quality-management-areas

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