



Cyngor Bwrdeistref Sirol  
**MERTHYR TUDFUL**  
**MERTHYR TYDFIL**  
County Borough Council

# Merthyr Tydfil County Borough Council 2023 Air Quality Progress Report

In fulfilment of Part IV of the Environment Act 1995, as amended by the Environment Act 2021

Local Air Quality Management

Date: (September 2023)

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# Executive Summary: Air Quality in Our Area

## Air Quality in Merthyr Tydfil County Borough

### Ansawdd Aer ym Mwrdeistref Sirol Merthyr Tudful

Prif ffynhonnell llygredd yr aer ym Merthyr Tudful yw traffig ffordd. Mae CBSMT felly'n bryderus ynghylch NO<sub>2</sub>. Mae rhwydwaith o diwbiau tryledol yn gweithredu trwy'r ardal. Yn ystod y 6 mlynedd ddiwethaf, cofnodwyd y cofnod uchaf o NO<sub>2</sub> yn yr ardal yn 2013 ac mae'r lefel, ers hynny wedi gostwng. Mae'r gostyngiad hyn wedi lefelu yn ystod y blynyddoedd diwethaf. Yn ystod 2019, roedd pob lleoliad ym Merthyr Tudful wedi cyflawni crynodiadau NO<sub>2</sub> a oedd oddi fewn i gymedr blynyddol yr amcan ansawdd aer.

Er bod pob lleoliad yn awr yn is na'r amcan ansawdd aer hyd at 2019, roedd un lleoliad yn parhau i fod oddi fewn 10% o gymedr blynyddol yr amcan ansawdd aer. Gwelodd data ar gyfer 2020, gwymmp pellach ledled y fwrdeistref ac nid oedd yr un safle oddi fewn 10% o gymedr blynyddol yr amcan ansawdd aer. Yn ôl y disgwyl, cynyddodd crynodiadau yn ystod 2023, fodd bynnag, parhaodd pob lleoliad i fod yn fwy na 10% yn is na

### 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<sub>2</sub>. A network of diffusion tubes operates throughout the district. In the past 9 years NO<sub>2</sub> 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<sub>2</sub> 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 saw a further reduction across the borough with no sites being within 10% of the annual mean air quality objective. As anticipated, concentrations increased during 2021 however, all sites remained more than 10% below the annual mean air quality objective. Since 2017 there has been an AQMA in place along Twynyrodyn Road. More information is available at <http://uk-air.defra.gov.uk/aqma/local->

chymedr blynyddol yr amcan  
ansawdd aer. Ers 2017 mae Cynllun  
Gweithredu Ansawdd (AQMA) wedi  
bod yn ei le ar hyd Ffordd  
Twynyrodyn. Mae rhagor o  
wybodaeth ar gael ar [https://uk-air.defra.gov.uk/aqma/local-authorities?la\\_id=402](https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=402) ac ar  
[www.merthyr.gov.uk](http://www.merthyr.gov.uk)  
<http://www.merthyr.gov.uk>. Yn dilyn  
ymgyngoriad cyhoeddus a  
chymeradwyaeth gan y Cyngor,  
cymeradwyodd Llywodraeth Cymru'r  
cynllun gweithredol i wrthdroi llif y  
traffig ar hyd Stryd Fawr Pontmorlais  
a Heol yr Eglwys fel camau  
cychwynnol i ymdrin â'r AQMA.

Ar 28 Mai 2019, cafodd y llif traffig ei  
wrthdroi ar hyd Stryd Fawr  
Pontmorlais a Heol yr Eglwys.  
Darparodd hyn lwybrau amgen, i  
ffwrdd o Tesco a chanol y dref yn  
hytrach na bod angen defnyddio  
Ffordd Twynyrodyn. Ymddengys fod  
traffig sy'n ymgynnull wedi symud a  
bod llai o dagfeydd traffig ar Ffordd  
Twynyrodyn.

Mae CBSMT hefyd yn ystyried effaith  
yr ansawdd aer ar ddatblygiadau  
newydd, a lle y mae hynny'n bosibl,  
defnyddir amodau cynllunio er mwyn  
lliniaru'r effeithiau negyddol. Mae'r  
Cynllun Trafnidiaeth Lleol yn cefnogi  
teithio llesol a'r defnydd o drafnidiaeth

[authorities?la\\_id=402](https://www.merthyr.gov.uk) and  
[www.merthyr.gov.uk](http://www.merthyr.gov.uk). Following public  
consultation and Council approval, the  
WG approved the action plan to  
reverse the traffic flow along  
Pontmorlais High Street and Church  
Street as an initial action to address  
concentrations of NO<sub>2</sub> within the  
AQMA.

On 28<sup>th</sup> 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.

gyhoeddus er mwyn lleihau  
dibyniaeth ar geir.

## **Actions to Improve Air Quality**

### **Camau i Wella Ansawdd yr Aer**

O ran AQMA Twynyrodyn, yn 2018, cynhaliwyd ymgynghoriad cyhoeddus am 12 wythnos. Ymgynghorwyd â'r cyhoedd ynghylch 3 opsiwn i leihau traffig ar Ffordd Twynyrodyn. Mynegodd y mwyafrif (94%) y byddai'n well ganddynt yr opsiwn i wiroi llif y traffig ar hyd Stryd Fawr Pontmorlais ac Heol yr Eglwys. Cymeradwyodd y Cyngor gynllun gweithredu a'i gyflwyno i Lywodraeth Cymru i'w gymeradwyo.

Yn Nhachwedd 2018, cyhoeddodd Adran y Priffyrdd a Pheirianeg, Orchmynion Rheoliadau Traffig. Ar 28 Mai 2019, cafodd y llif traffig ei wrthdroi, yn unol â'r cynllun gweithredu a gymeradwywyd. Mae cyfrifiadau traffig ar gael sydd yn meintoli arsylwadau a wnaethpwyd gan Swyddogion Iechyd yr Amgylchedd fod llai o dagfeydd traffig ar AQMA Ffordd Twynyrodyn. Dangosodd yr arolwg traffig a gynhaliwyd cyn ac wedi gwrthdroi llif y traffig ar hyd Stryd Fawr Pontmorlais

### **Actions to Improve Air Quality**

With regard to the Twynyrodyn 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 November 2018 the Highways and Engineering Departments issued Traffic Regulation Orders. On 28<sup>th</sup> 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

ostyngiad yn nifer y traffig yn teithio ar hyd AQMA Ffordd Twynnyrodyn. Dynodwyd. cyfartaledd o 428 o gerbydau ar Ddydd Gwener pan roedd y traffig drymaf. Nodwyd rhai tagfeydd o amgylch Avenue De Clichy a Stryd Fawr Pontmorlais yn ystod oriau brig a oedd hefyd i'w gweld yn yr arolwg traffig â chyfartaledd cynnydd dyddiol o 677 o symudiadau cerbydau ar hyd Avenue De Clichy. Ni ystyrir hyn i fod yn risg iechyd i'r cyhoedd gan fod eiddo preswyl wedi'u lleoli yn ôl o'r ffordd ac nad oes yr un ardal lle y byddai pobl yn debygol o dreulio 1 awr neu fwy. Ar ochr orllewinol Avenue De Clichy mae Afon Taf, felly nid oes hafnau stryd posibl. Mae arsylwadau cynnar yn awgrymu fod gwirdroi llif y traffig wedi gwella ansawdd aer yr AQMA ac mae hyn yn parhau i fod yn wir.

Twynnyrodyn 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 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 to date.

## Local Priorities and Challenges

### Blaenoriaethau Lleol a Heriau

Y flaenoriaeth ar gyfer 2019 oedd gweithredu'r cynllun a gymeradwywyd ac ar fonitro a'i effeithioldeb. Er mwyn gwneud hyn, mae tiwbiau tryledol ychwanegol wedi cael eu gosod ar hyd y llwybr traffig sydd wedi ei

### 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 re-

wrthdroi ac ar strydoedd cyfagos. Cafodd monitor yr ECC ei adleoli i Stryd Fawr Pontmorlais lle y parhaodd hyd Awst 2023. Profodd y monitor yn annibynadwy yn ystod 2021 yn sgil cyfnodau hir heb ddata. Ers ei weithrediad, nid yw'n ymddangos fod y traffig wedi cynyddu crynodiadau NO<sub>2</sub> yn arwyddocaol ar hyd Stryd Fawr Pontmorlais neu unrhyw wyriad arall.

Roedd crynodiadau NO<sub>2</sub> ar gyfer 2023, yn sgil y cyfnod clo cenedlaethol dipyn yn llai o ganlyniadu i leihad mewn symudiadau cerbydau. Felly, nid oedd y mwyafrif o'r data ar gyfer 2020 yn gynrychiolaeth gywir. Y flaenoriaeth ar gyfer 2020 oedd cynnal y rhwydwaith monitro a gohirio dirymiad yr AQMA yn 2021. Y tu hwnt i hynny, byddai monitro parhaus er mwyn arddangos fod y crynodiadau yn parhau i fod dros 10% yn llai na chymedr yr ansawdd aer blyneddol yn caniatáu i'r AQMA gael ei dirymu yn 2023 neu 2024. Petai crynodiadau'n codi oddi fewn 10% neu'n mynd yn fwy na chymedr yr amcan ansawdd aer blyneddol, byddai gwaith ychwanegol yn cael ei ystyried mewn cynlluniau gwaith newydd.

Mae monitro hefyd wedi cael ei ymestyn i gynnwys tiwbiau tryledol

located to Pontmorlais High Street where it remained until August 2023, although the monitor proved unreliable during 2021 due to prolonged periods offline with no data received. Since its implementation, the traffic reversal doesn't appear to have significantly increased concentrations of NO<sub>2</sub> along Pontmorlais High Street or any other diversion route.

NO<sub>2</sub> concentrations for 2020 following implementation of the national lockdown due to the coronavirus pandemic were significantly lower due to the associated decrease in vehicle movements. As such, the majority of the data for 2020 was not a true representation of concentrations for the area in terms of typical circumstances. As such, the priority for 2020 was to maintain the monitoring network and delay the intended revocation of the AQMA in 2021. Beyond that, continued monitoring and demonstration that concentrations remain more than 10% below the annual mean air quality objective would allow the AQMA to be revoked in 2023 or 2024. Should concentrations increase to within 10% or exceed the annual mean air quality objective, additional works will be considered in updated action plans.

ychwanegol mewn mannau a ddynodwyd gan arolwg Sŵn a Seinwedd Llywodraeth Cymru lle y gall traffig trwm hefyd effeithio ar ansawdd yr aer.

Yn ogystal, yn 2018, dynododd rhai misoedd unigol o ddata o diwb tryledol 6/7 Maes Ladysmith, Ffordd Caerdydd, CF48 4JH y gallai'r cymedr blyneddol o NO<sub>2</sub> pe na bai'n cael ei drin, godi'n uwch na 36µg/m<sup>3</sup>, oddi fewn i 10% o nod cymedr blyneddol ansawdd yr aer.

Dangosodd arsylwadau fod tagfeydd traffig yn achosi canlyniadau mynediad/allanfa i geir o faes parcio wrth gefn Ysgol Gynradd Gymunedol Troedyrhiw a cheir sydd wedi eu parcio ar hyd Ffordd Caerdydd.

Cafodd system unffordd, dros dro ei weithredu yn ystod Rhagfyr 2018 ac yn gynnwys ym mis Ionawr 2019 er mwyn asesu effaith y maes parcio.

Dangosodd data na wnaeth y crynodiad ar y safle gynyddu i gyd fynd â lleoliadau monitro eraill yn y fwrdeistref sydd yn ddisgwyliedig yn ystod cyfnodau oerach. Yn ystod 2019, gostyngodd y crynodiad NO<sub>2</sub> ar gyfer 6/7 Maes Ladysmith rhywfaint, fodd bynnag gosodwyd tiwb ar gyfer asesiad pellach o Ffordd Caerdydd yn 37 Teras Brookfield. Ers iddo gael ei osod, mae crynodiadau wedi

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 annual mean concentration of NO<sub>2</sub> could have exceeded 36µg/m<sup>3</sup>, within 10% of the annual mean air quality objective. Observations showed bottle-necks were caused by car access/egress from a car park to the rear of Troedyrhiw Community Primary School, combined with parked cars along Cardiff Road. A temporary one way system was implemented during December 2018 and early January 2019 to assess the impact of the car park. Data showed that the concentration at that site did not increase correspondingly to other monitoring sites across the borough, which is expected for colder periods. During 2019 the concentration of NO<sub>2</sub> for 6/7 Ladysmith Place had decreased slightly however, an additional tube for further assessment of Cardiff Road was installed at 37 Brookfield Terrace. Since its installation, concentrations have

parhau i fod yn fwy na 10% yn is nag amcanion y cymedr ansawdd aer y ddau safle.

Cafodd y gyfnewidfa fysiau newydd ei chwblhau ar Stryd yr Alarch yn ystod mis Mai 2021 a daeth yn weithredol yn ystod Mehefin 2021. Cafodd y rhydwraith cyfredol ei ymestyn i gynnwys 4 pwynt monitro newydd gerllaw safle'r gyfnewidfa newydd. Yn 2022, derbyniwyd data blwyddyn gyfan ar gyfer y 4 pwynt monitro ychwanegol ac roedd pob un ohonynt yn is nag amcanion y cymedr ansawdd aer. Roedd y crynodiad uchaf ar safle polyn lamp Stryd yr Alarch yn  $18.8\mu\text{g}/\text{m}^3$ .

Mae gwaith yn mynd rhagddo ar gynllun deuli'r A465 ac mae hyn wedi codi pryderon gan aelodau'r cyhoedd; yn bennaf ynghylch cynnydd mewn traffig ar y Stryd Fawr, Dowlais, yn arwain at Gylchfan Dowlais yn sgil gwiriadau traffig a mesurau tawelu traffig gweithredol yn ystod y gwaith. Hyd yn hyn, nid yw crynodiadau ar bwynt monitro'r Stryd Fawr, Dowlais yn dangos fod eisiau archwiliadau pellach. Mae data 2021 yn dangos crynodiad o  $21\mu\text{g}/\text{m}^3$  a  $21.3\mu\text{g}/\text{m}^3$  ar gyfer 2022.

remained more than 10% below the annual mean air quality objective at both sites.

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 was extended to include 4 new monitoring points around the vicinity of the new interchange. 2022 saw the first whole year data capture for the 4 new additional monitoring points and all are well below the annual mean air quality objective, with the highest concentration being at the Swan Street, lamp-post site at  $18.8\mu\text{g}/\text{m}^3$ .

Ongoing works to the A465 dualling project have raised concerns from members of the public, particularly of increased traffic volume on Dowlais High Street, leading to the Dowlais roundabout, as a result of diversions and traffic calming measures implemented for the construction phase. To date, concentrations at the existing monitoring point at Dowlais High Street have not shown concentrations to prompt further investigation with data for 2021 being an annual mean concentration of  $21\mu\text{g}/\text{m}^3$  and  $21.3\mu\text{g}/\text{m}^3$  for 2022.

## How to Get Involved

### Sut i Wybod Mwy

Gellir cael mwy o wybodaeth am lygredd aer ac adroddiadau ar ansawdd yr aer blaenorol ar [www.merthyr.gov.uk](http://www.merthyr.gov.uk). Gellir codi cwestiynau pellach trwy e-bostio [PublicHealth@merthyr.gov.uk](mailto: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](http://www.merthyr.gov.uk). Specific questions can be addressed by emailing [PublicHealth@merthyr.gov.uk](mailto: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
<b>First stage review and assessment</b>	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 <sub>10</sub> , SO <sub>2</sub> and NO <sub>2</sub> being exceeded.
<b>Second stage review and assessment</b>	2000	Negligible risk of AQS objectives for PM <sub>10</sub> , SO <sub>2</sub> and NO <sub>2</sub> being exceeded in area.  Unnecessary to proceed further with review and assessment process or declare AQMAs.
<b>Updating and screening assessment and progress reports</b>	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.
<b>Updating and screening assessment and progress reports</b>	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.

		<p>Progress report 2007 found NO<sub>2</sub> levels had increased but within AQS objective of 40µg/m<sup>3</sup> at all locations.</p> <p>Level at 55 Twynyrodyn Road was within 10% of the limit and monitoring network expanded in this area.</p> <p>Progress report 2008 found levels increased and at 55 Twynyrodyn Road, a marginal exceedance identified.</p> <p>Considered necessary to proceed to detailed assessment.</p>
<b>Detailed assessment</b>	2009	<p>Reviewed data for monitoring sites on Twynyrodyn Road and modelled NO<sub>2</sub> levels for length of the road.</p> <p>Recommended siting of additional diffusion tubes at various points on road and declaring AQMA.</p>
<b>Updating and screening assessment and progress reports</b>	2009-2011	<p>NO<sub>2</sub> reduced, AQS objectives met at all locations with relevant public exposure.</p> <p>2010 progress report determined based on reduction no longer necessary to carry out further detailed assessment or declare AQMA.</p> <p>Detailed assessments necessary for 2 new permitted processes and 1 substantially changed installation.</p> <p>Progress report 2011 found NO<sub>2</sub> levels had increased throughout the borough, with marked exceedance at 55 Twynyrodyn Road.</p> <p>Considered necessary to increase number of monitoring sites on Twynyrodyn Road prior to declaring AQMA in relation to this site.</p>

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

		<p>Predominantly associated with uphill traffic during early evening.</p> <p>Considered necessary to declare AQMA from Western End of Twynyrodyn Road to 147 Gilfach Cynon.</p> <p>MTCBC declared AQMA on 30<sup>th</sup> Jan 2017.</p>
<b>Updating and screening assessment and progress reports</b>	2015-2017	<p>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.</p> <p>NO<sub>2</sub> exceedances were contained within AQMA on Twynyrodyn Road.</p> <p>Action plan under development for public consultation, on options to improve traffic flow and reduce traffic numbers.</p> <p>Additional monitoring in Swansea Road in anticipation of Trago Mills opening, attracting additional traffic to Swansea Road area.</p>
<b>Annual report</b>	2018	<p>NO<sub>2</sub> exceedances were contained within AQMA on Twynyrodyn Road.</p> <p>Action plan to reverse traffic flow along Pontmorlais High Street and Church Street approved by Welsh Government following public consultation and Council approval.</p> <p>Impact of Trago Mills on Swansea Rd has not resulted in annual mean within 10% of AQS objectives.</p> <p>Monitoring network reviewed and as of Jan 2019 network will be extended to include traffic reversal</p>

		area, Troedyrhiw and areas identified in Welsh Government Noise and Soundscape survey.
<b>Annual report</b>	2019	<p>Action plan implemented to reverse traffic flow along Pontmorlais High Street and Church Street on 28<sup>th</sup> May 2019.</p> <p>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.</p> <p>A decrease in levels of NO<sub>2</sub> on Swansea Road around the Trago Mills site has been observed.</p> <p>All sites within the AQMA are now below the annual air quality objective however one site remains within 10% of the AQS objective.</p>
<b>Annual report</b>	2020	<p>Continued monitoring of network to assess effectiveness of the traffic reversal and changes around the town centre and along Pontmorlais High Street.</p> <p>Proposal to revoke the AQMA in 2021 if levels were shown to have continued to remain outside 10% of the AQS objective.</p>
<b>Annual report</b>	2021	<p>Continued monitoring of network to assess the effectiveness of the traffic reversal and changes around the town centre and along Pontmorlais High Street.</p> <p>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.</p>

<b>Annual report</b>	2022	<p>Continued monitoring of network to assess the effectiveness of the traffic reversal and changes around the town centre and along Pontmorlais High Street.</p> <p>On course to revoke AQMA in 2024 as concentrations at all monitoring sites remain more than 10% below the AQS objective.</p>
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NO<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> in the AQMA. A 12 week public consultation was carried out from 16<sup>th</sup> March 2018 to 8<sup>th</sup> June 2018. The majority (94%) of consultation responses were in favour of reversing the traffic flow along Pontmorlais High Street and Church Street. Following the public consultation, on 27<sup>th</sup> 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 17<sup>th</sup> July 2018. The Highways and engineering departments issued the relevant traffic management orders and following these on 28<sup>th</sup> May 2019 reversed the traffic flow along Pontmorlais High Street & Church Street.

During some months in 2018 there was an elevated NO<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> concentration was below 36µg/m<sup>3</sup> (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 was likely to breach the AQS objective. Both 6/7 Ladysmith Place & 37 Brookfield Terrace were more than 10% below the AQS at 33.2µg/m<sup>3</sup> and 27.8µg/m<sup>3</sup> 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/m<sup>3</sup> and 20.9µg/m<sup>3</sup> 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<sub>2</sub> concentrations at both sites. The unadjusted average for 6/7 Ladysmith Place was 50.8µg/m<sup>3</sup> in 2019 and 42.3µg/m<sup>3</sup> in 2020. Similarly, the unadjusted average for 37 Brookfield Terrace was 44.7µg/m<sup>3</sup> in 2019 and 32.8µg/m<sup>3</sup> 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<sub>2</sub> 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<sub>2</sub> concentrations within the AQMA in addition to ongoing focus on Cardiff Road. Notwithstanding, data for 2021 was encouraging at both 6/7 Ladysmith Place and 37 Brookfield Terrace, with the mean concentrations of NO<sub>2</sub> at each site being 28.8µg/m<sup>3</sup> and 23.6µg/m<sup>3</sup> respectively. Data for 2022 showed concentrations of NO<sub>2</sub> at 26.3µg/m<sup>3</sup> for 6/7 Ladysmith Place and 22.9µg/m<sup>3</sup> at 37 Brookfield Terrace, a decrease of 9% and 3% respectively from 2021. As such there is no anticipation at present that further focus is necessary along Cardiff Road.

Data for 2022 for all monitoring locations remains more than 10% below the AQS with the greatest concentration of 31µg/m<sup>3</sup> recorded at 11 Park Place, Penydarren Road, still well below the AQS objective.

## 1.2 Air Quality Management Areas

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

A summary of AQMA(s) declared by Merthyr Tydfil County Borough Council can be found in Table 1.1. Further information relating to declared or revoked AQMA(s), 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 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**

<b>AQMA</b>	<b>Relevant Air Quality Objective(s)</b>	<b>Comments on Air Quality Trend</b>	<b>District</b>	<b>Description</b>	<b>Action Plan</b>
Twynyrodyn Road	NO <sub>2</sub> 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 28 <sup>th</sup> 2019. Further monitoring has shown marginal increase from 2020 however, concentrations remain 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 <a href="https://www.merthyr.gov.uk/resident/pests-pollution-food-hygiene/air-pollution/">https://www.merthyr.gov.uk/resident/pests-pollution-food-hygiene/air-pollution/</a>

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](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 took forward a number of measures during 2017 – 2020 in pursuit of improving local air quality. Details of measures completed, in progress or planned are set out in Table 1.2. and can be found in the Air Quality Action Plan at [www.merthyr.gov.uk](http://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 28<sup>th</sup> 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<sub>2</sub> 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<sub>2</sub> concentrations, it is prudent that robust data be collected before a decision to revoke the AQMA is made. It was anticipated that the significantly lower NO<sub>2</sub> 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 however, was encouraging with the highest concentration of 33µg/m<sup>3</sup> at 51 Twynyrodyn Road being 18% below the AQS of 40µg/m<sup>3</sup>. Furthermore, data for 2022 showed the highest concentration within the AQMA, again at 51 Twynyrodyn Road to be 30.4µg/m<sup>3</sup>, a further reduction from 2021 and 24% below the AQS objective of 40µg/m<sup>3</sup>. If annual mean NO<sub>2</sub> concentrations within the AQMA continue to remain below 36µg/m<sup>3</sup>, this will enable revocation of the AQMA in 2024.

Although air quality in the Merthyr Tydfil Borough is encouraging in terms of NO<sub>2</sub> 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

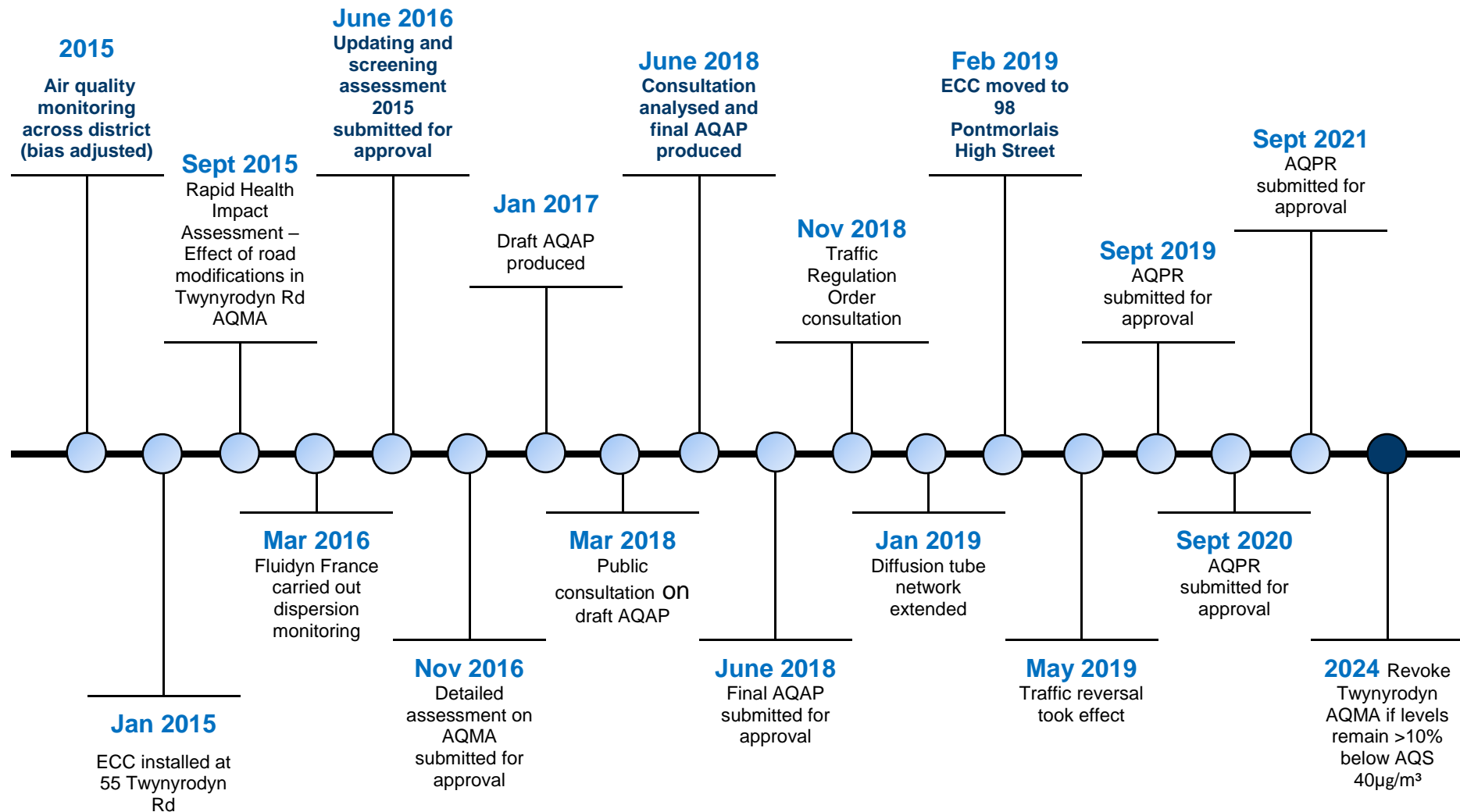


Table 1.2 – Progress on Measures to Improve Air Quality

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 <sub>2</sub> 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 <sub>2</sub> 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 <sub>2</sub> at monitoring sites along Twynyrodyn Road, and reduced traffic counts along Twynyrodyn Road	Reduction of 10µg/m <sup>3</sup> at monitoring sites 14 and 21.	In 2021 site 14 has reduced by 12.3 µg/m <sup>3</sup> and site 21 has reduced by 15.7 µg/m <sup>3</sup> since 2017. There has been a reduction in levels of NO <sub>2</sub> within the AQMA with all sites now below the AQS objective of 40µg/m <sup>3</sup>	Although concentrations have marginally increased, they remain more than 10% below the AQS objective of 40µg/m <sup>3</sup>	2020	The implementation of the action plan seems to have reduced NO <sub>2</sub> within the AQMA post Period 6 (2019). Despite the anomalous data of 2020, 2 years of data have shown overall reduction in concentrations at well below the AQS objective since.

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 2022	Newly permitted businesses are being given support to reduce their risk to the lowest possible for each site and process	2022	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 25 <sup>th</sup> 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 263 people have joined the scheme	13 additional successful applications	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 Twynnyroddyn 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 2022

#### 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 2022 however, the equipment developed a fault but was operational for 40% of the year. As data capture is below 85% for 2022, it has been necessary to annualise the data. (See Appendix C). PM<sub>10</sub> and PM<sub>2.5</sub> 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. The TEOM developed a fault during the monitoring period which has resulted in very limited and erroneous data which cannot be used to reflect concentrations for the monitoring period. It should however, be noted that PM<sub>10</sub> and PM<sub>2.5</sub> levels have been low over the previous 4 years with no exceedances of the 40µg/m<sup>3</sup> for PM<sub>10</sub> or 25µg/m<sup>3</sup> for PM<sub>2.5</sub> annual mean objectives and no exceedances of the 24hour mean objective of 50µg/m<sup>3</sup> for PM<sub>10</sub> (not to be exceeded more than 35 times per year). The likelihood that levels have increased to concerning levels is low. [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<sub>2</sub> at 35 sites during 2022. **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**

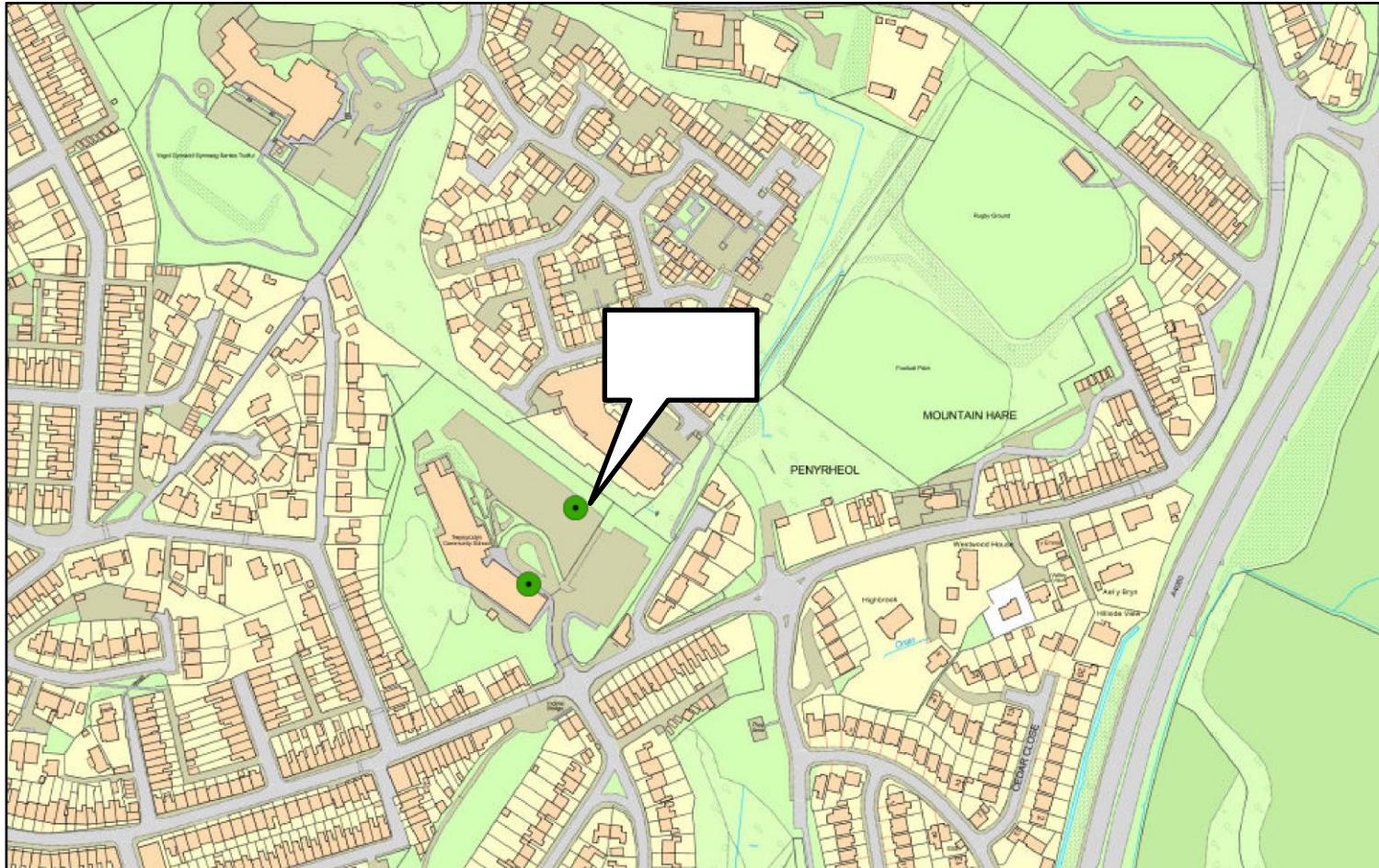
Site ID	Site Name	Site Type	Associated with (Named) AQMA?	X OS Grid Reference	Y OS Grid Reference	Pollutants Monitored	Monitoring Technique	Inlet Height (m)	Distance from monitor to nearest relevant exposure (m) <sup>(1)</sup>	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
APM1	Twynyrodyn School	Suburban		305821	206008	PM <sub>10</sub> PM <sub>2.5</sub>	TEOM	2.43	0	0	N/A
ECC	98 Pontmorlais	Kerbside		304987	206411	NO <sub>2</sub>	ECC	2	0	0	2.9

**Notes:**

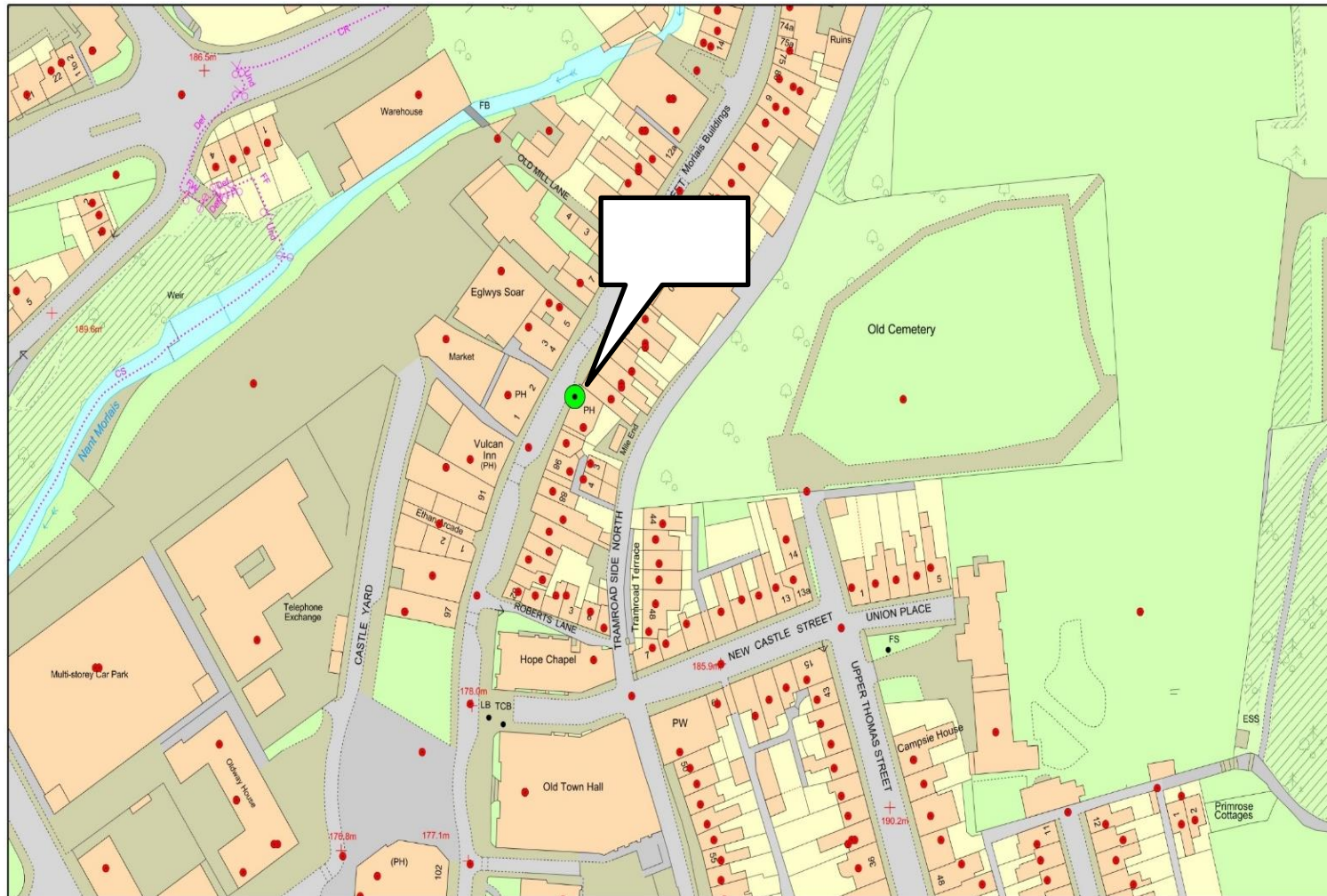
(1) 0m indicates that the sited monitor represents exposure and as such no distance calculation is required.

### Figure 2.1 – Map(s) 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) <sup>(1)</sup>	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	Twynrodyn 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	Twynrodyn Road AQMA	305382	205872	3.0	N	1.7	3.0	3.0

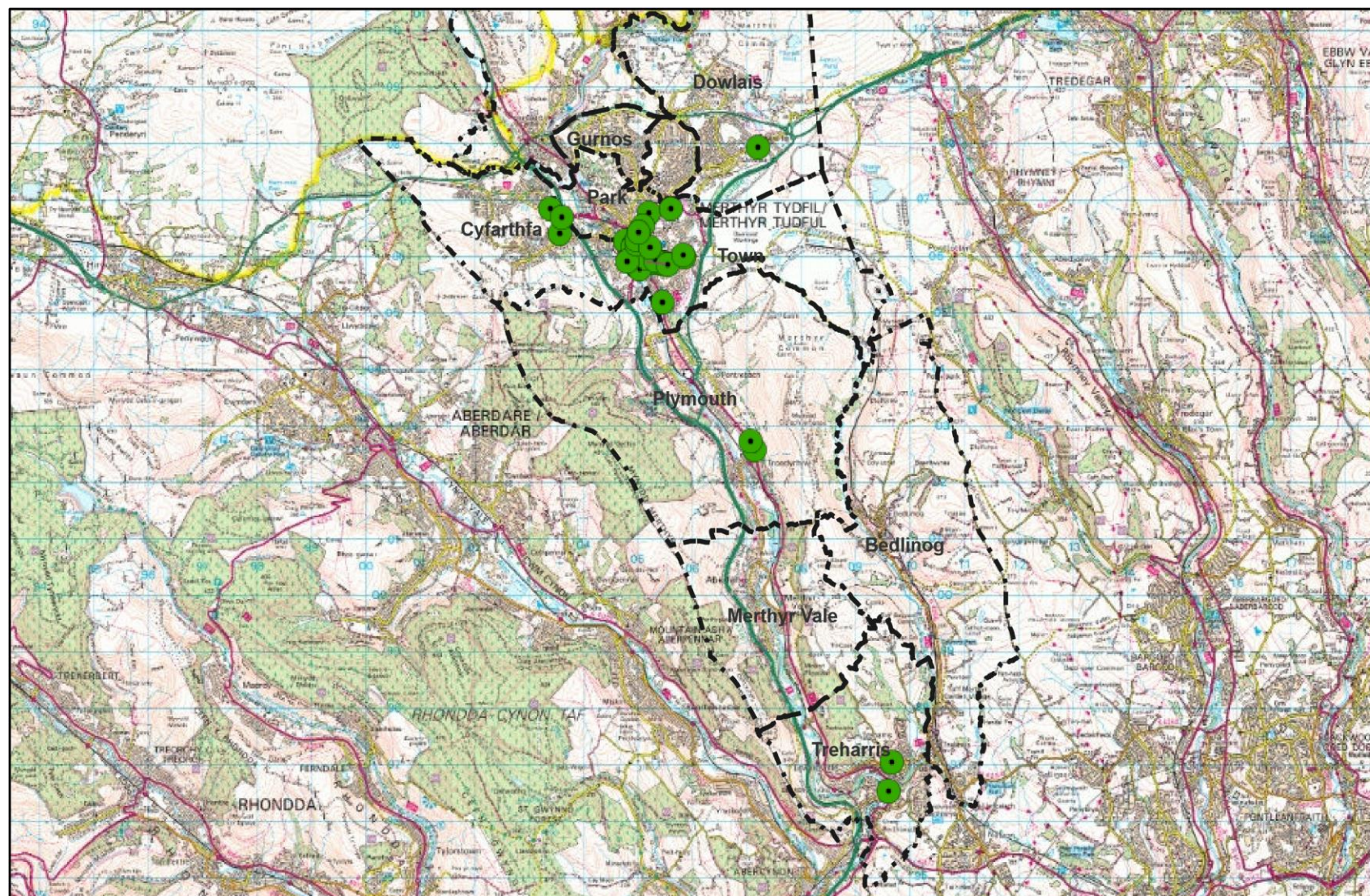
Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) <sup>(1)</sup>	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (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 Gylfach 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) <sup>(1)</sup>	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

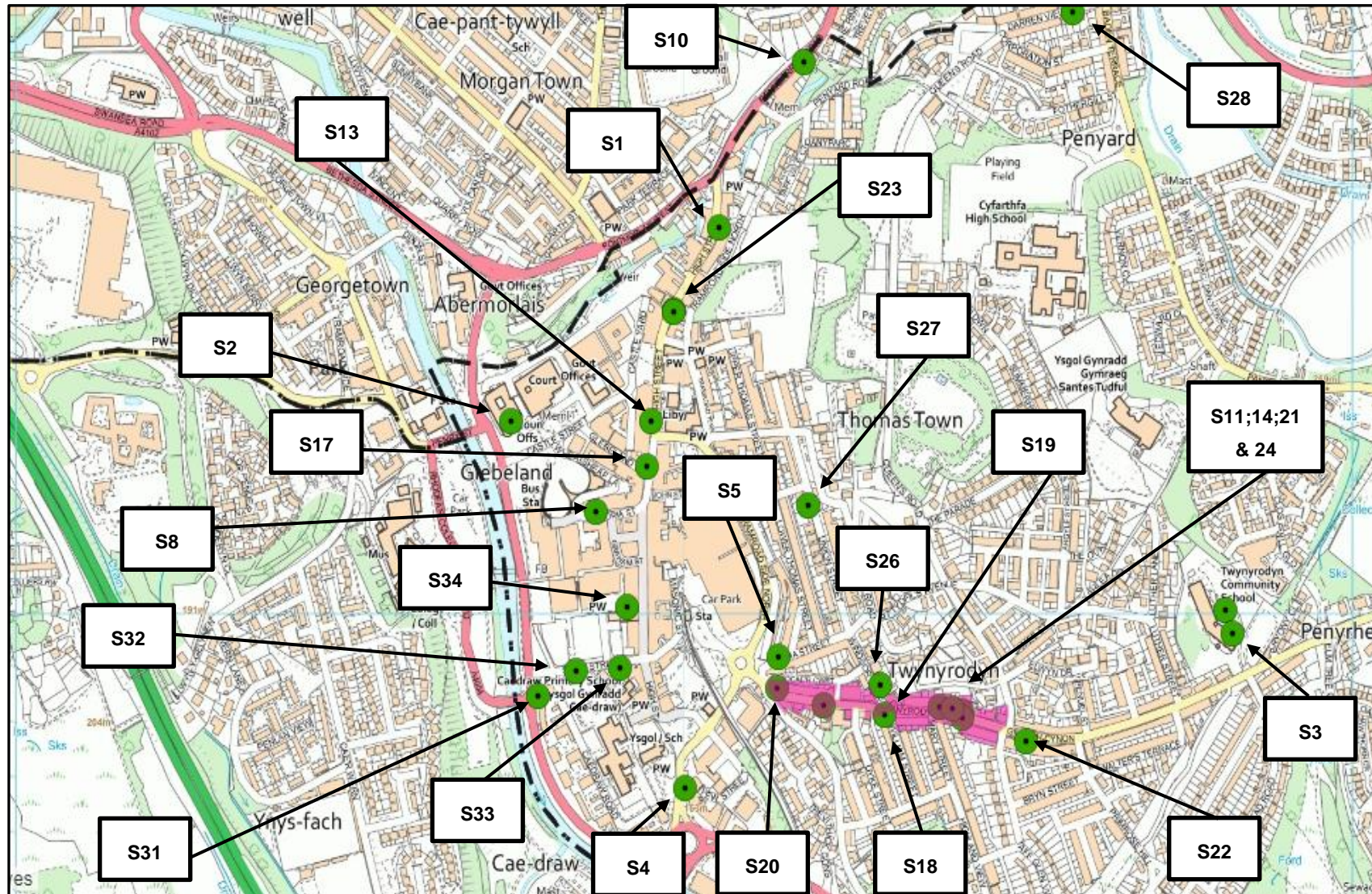
**Notes:**

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

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



## Map of Non-Automatic Monitoring Sites across Town Ward



## Map of Non-Automatic Monitoring Sites across Twynrobyn



## 2022 Air Quality Monitoring Results

**Table 2.3 – Annual Mean NO<sub>2</sub> Monitoring Results (µg/m<sup>3</sup>)**

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2018	2019	2020	2021	2022
ECC	Roadside / Urban Centre	Automatic	40	40	39.9	20.8	17.7	-	24.7(2)
1	Roadside	Diffusion Tube	100	100	20.8	23.1	21.4	25.9	25.8
2	Urban Background	Diffusion Tube	92	92	15.2	16.6	11.7	12.4	12.8
3	Suburban	Diffusion Tube	92	92	10.7	11.1	8.4	8.5	9.2
4	Urban Centre	Diffusion Tube	92	92	29.3	24.9	19.1	21.8	23.2
5	Roadside	Diffusion Tube	100	100	18.1	22.3	13.8	16.5	15.6
6	Roadside	Diffusion Tube	100	100	17.3	25.3	18.8	19.9	19.0
7	Roadside	Diffusion Tube	100	100	-	17.9	13	13.9	13.7
8	Urban Centre	Diffusion Tube	92	92	20.4	18.8	15.1	15.1	14.5
9	Suburban	Diffusion Tube	92	92	10.0	10.6	7.4	7.9	6.9
10	Roadside	Diffusion Tube	92	92	-	30.7	26.1	28.8	31.0
11	Roadside	Diffusion Tube	83	83	<b>40.3</b>	35	24.6	29.7	28.5
12	Roadside	Diffusion Tube	100	100	23.3	22	17.6	21.0	21.3
13	Urban Centre	Diffusion Tube	100	100	-	21.7	19.4	23.0	22.2
14	Roadside	Diffusion Tube	100	100	39.6	33.2	24.7	29.1	26.9

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2018	2019	2020	2021	2022
15	Suburban	Diffusion Tube	100	100	12.2	11.5	9.5	10.1	9.5
16	Suburban	Diffusion Tube	100	100	12.1	11.6	8.8	10.0	9.7
17	Urban Centre	Diffusion Tube	92	92	-	18.9	14.8	17.3	19.6
18	Roadside	Diffusion Tube	100	100	26.3	24.1	18.9	20.9	21.0
19	Roadside	Diffusion Tube	100	100	20.3	19.1	14.8	16.3	16.4
20	Roadside	Diffusion Tube	100	100	29.4	25.9	20.2	24.1	23.8
21	Roadside	Diffusion Tube	92	92	<b>47.0</b>	38.2	25.7	33.0	30.4
22	Urban Centre	Diffusion Tube	100	100	29.2	26	18.5	21.7	22.9
23	Roadside	Diffusion Tube	100	100	-	18.3	14.5	17.6	17.1
24	Roadside	Diffusion Tube	100	100	23.7	23.8	17.4	16.8	16.7
25	Suburban	Diffusion Tube	100	100	-	27.8	20.9	23.6	22.9
26	Suburban	Diffusion Tube	92	92	17.7	16.8	12.6	14.0	14.4
27	Suburban	Diffusion Tube	100	100	-	13.1	10.7	10.9	11.1
28	Roadside	Diffusion Tube	100	100	-	16.2	12.2	14.6	13.7
29	Roadside	Diffusion Tube	100	100	34.6	33.2	25.6	28.8	26.3
30	Roadside	Diffusion Tube	100	100	20.0	17.8	14.4	16.7	17.0
31	Roadside	Diffusion Tube	100	100	-	22.1	13.8	17.4	17.5
32	Roadside	Diffusion Tube	92	92	-	-	-	19.6(2)	18.8

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2018	2019	2020	2021	2022
33	Urban centre	Diffusion Tube	92	92	-	-	-	14.9(2)	14.2
34	Urban centre	Diffusion Tube	83	83	-	-	-	14.1(1)	13.4
35	Urban centre	Diffusion Tube	92	92	-	-	-	11.8(1)	11.2

**Notes:**

Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 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.TG22 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%).

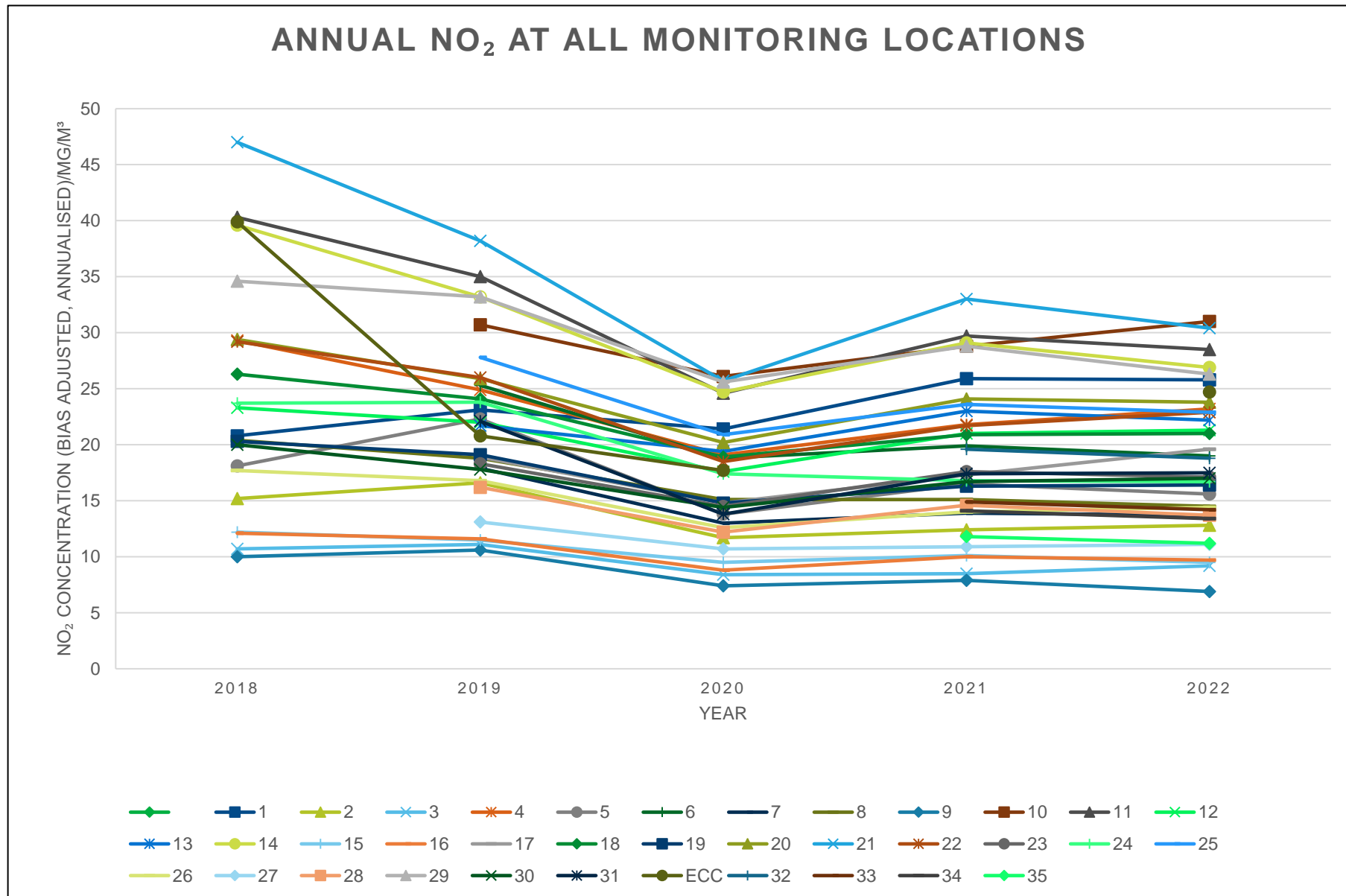
Figure 2.3 – Trends in Annual Mean NO<sub>2</sub> Concentrations

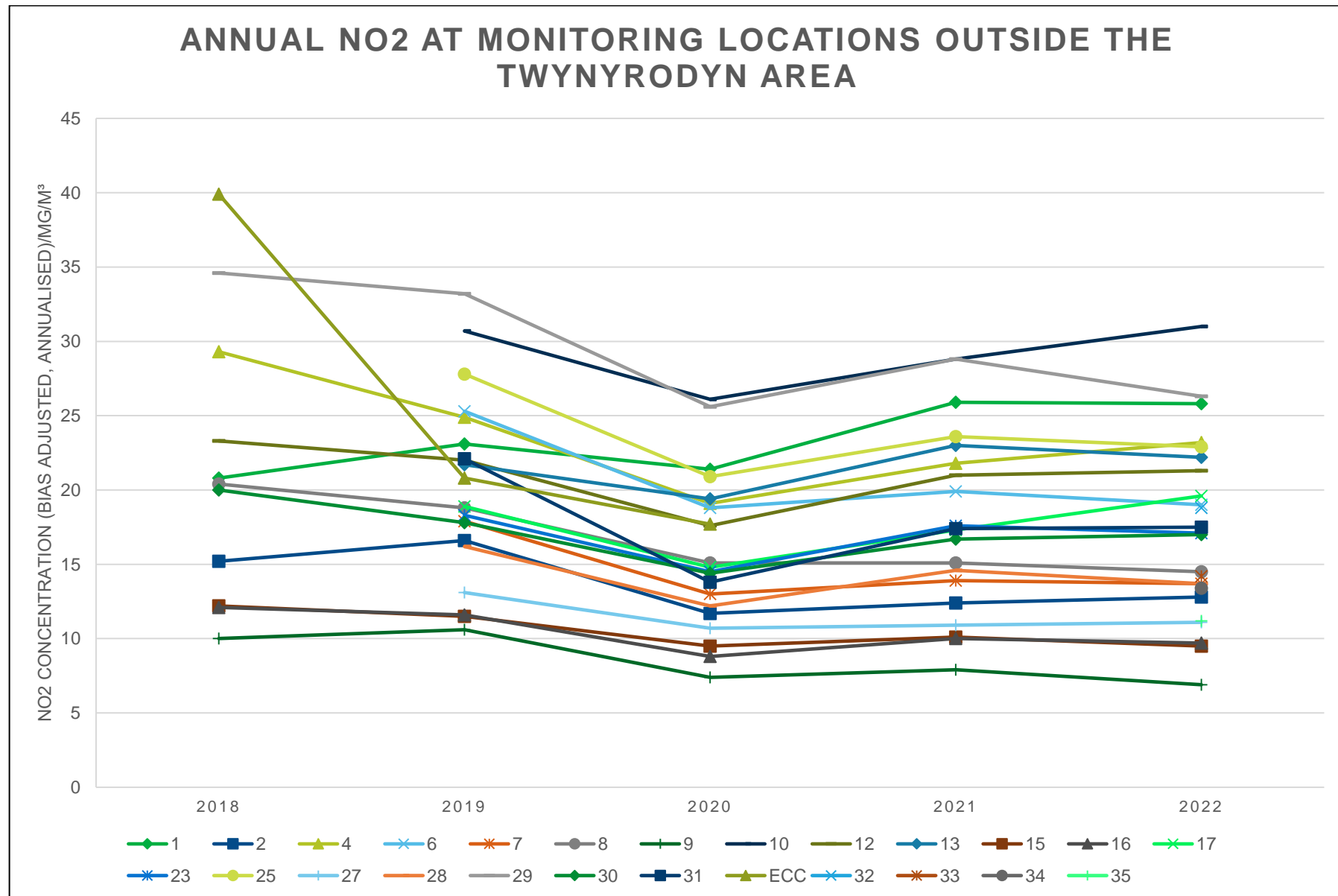
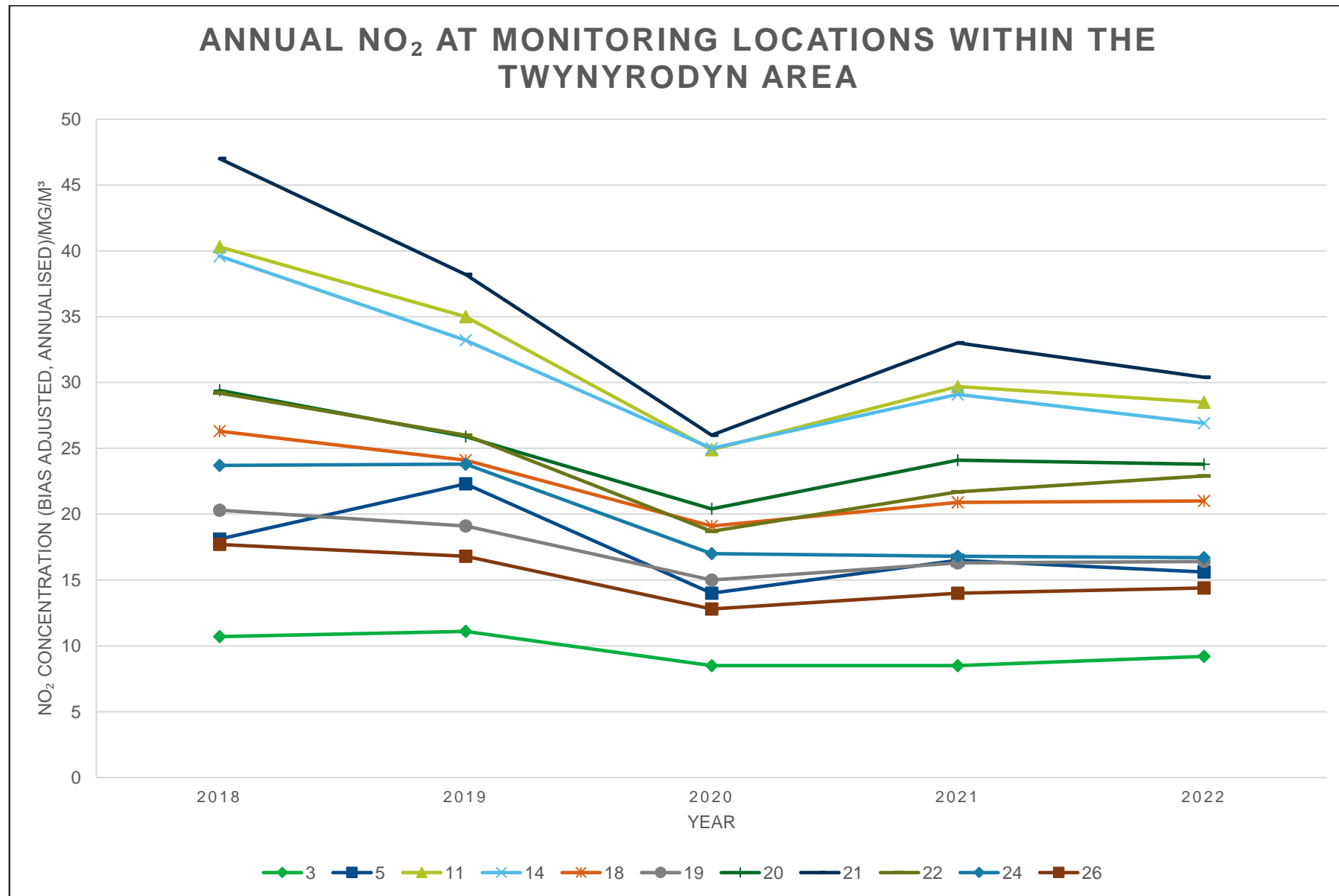
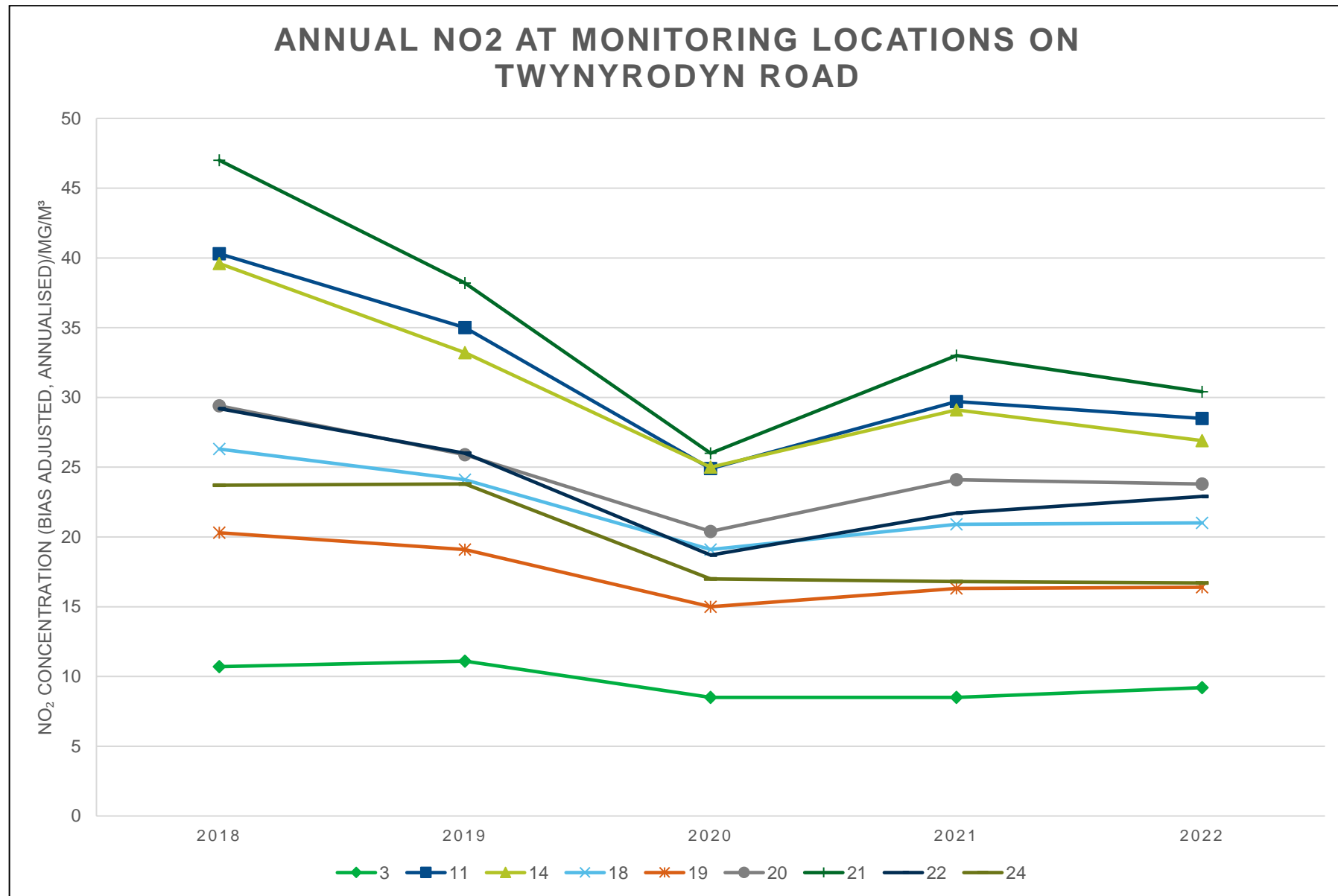
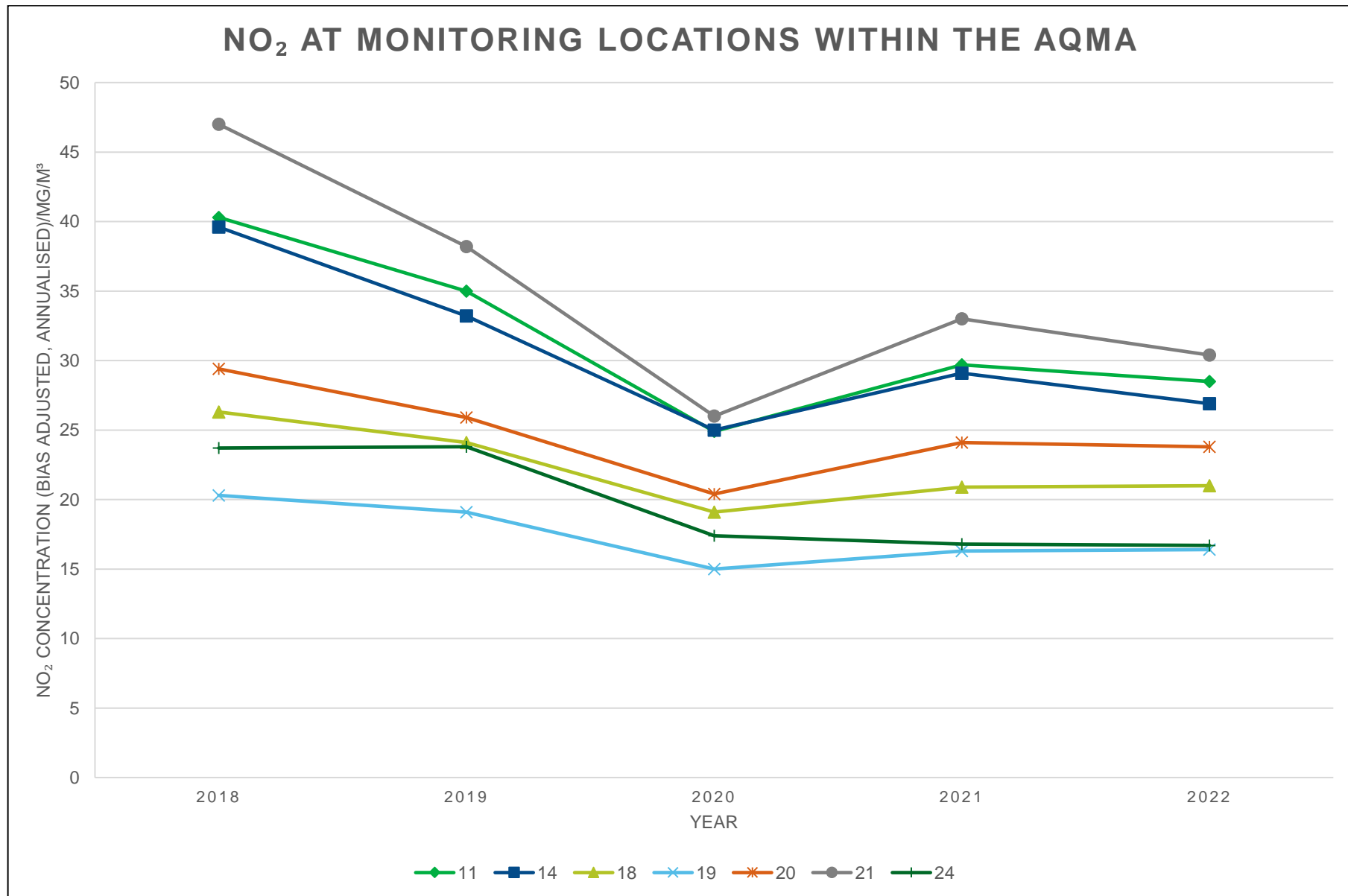
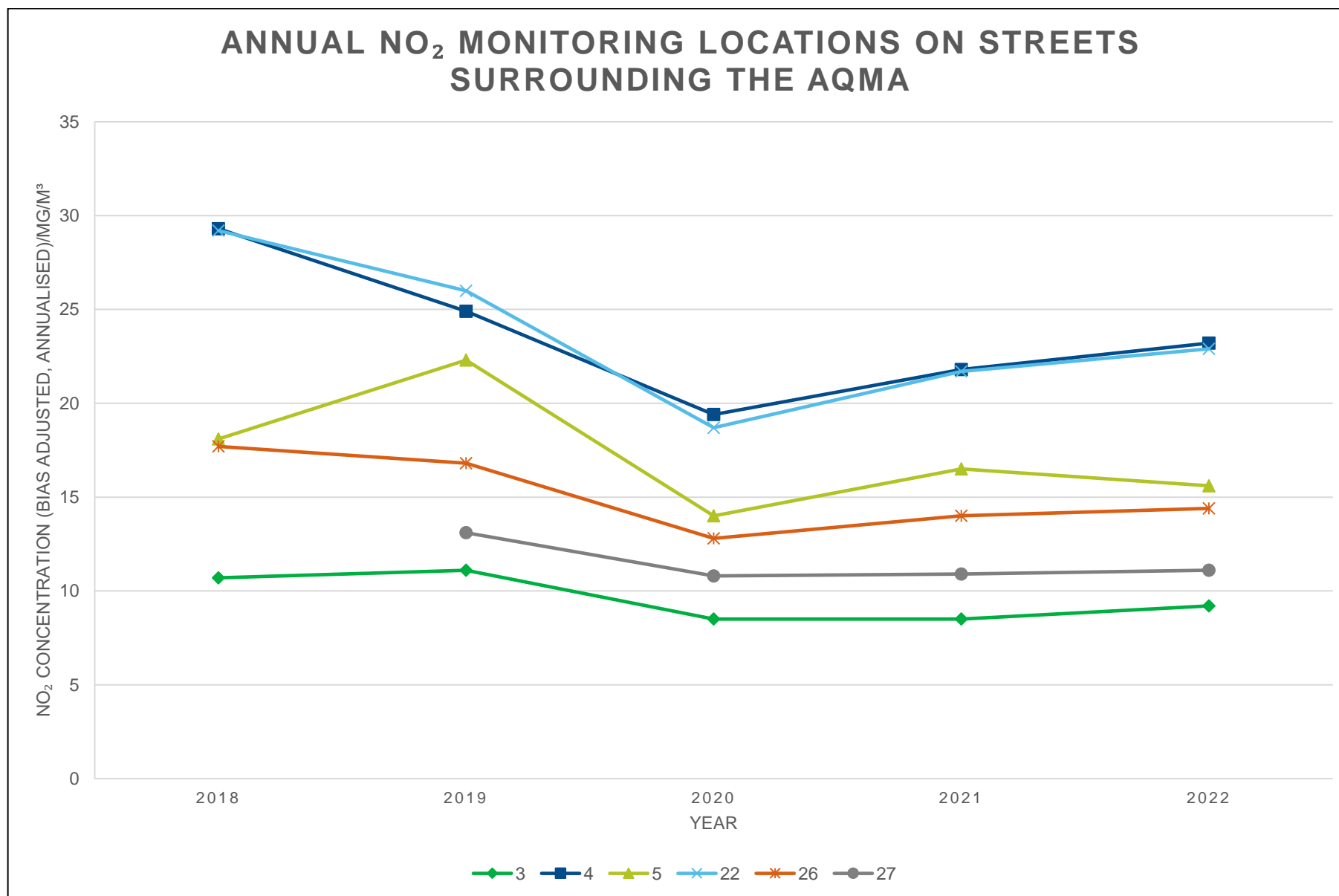
Figure 2.4 - Trends in Annual Mean NO<sub>2</sub> Concentrations – monitoring locations outside the Twynrodyn area

Figure 2.5 – Trends in Annual Mean NO<sub>2</sub> Concentrations – monitoring locations within the Twynyrodyn area

**Figure 2.6 - Trends in Annual Mean NO<sub>2</sub> Concentrations – monitoring locations on Twynyrodyn Road**

**Figure 2.7 – Trends in Annual Mean NO<sub>2</sub> Concentrations – monitoring locations within the AQMA**

**Figure 2.8 – Trends in Annual Mean NO<sub>2</sub> Concentrations – monitoring locations on streets surrounding the AQMA**

**Table 2.4 – 1-Hour Mean NO<sub>2</sub> Monitoring Results, Number of 1-Hour Means > 200µg/m<sup>3</sup>**

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2018	2019	2020	2021	2022
ECC	Roadside	Automatic	40	40	<b>1(153.7)</b>	0	0	-	0 (92.2) <sup>1</sup>

**Notes:**

Exceedances of the NO<sub>2</sub> 1-hour mean objective (200µg/m<sup>3</sup> 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 2.4 – Annual Mean PM<sub>10</sub> Monitoring Results (µg/m<sup>3</sup>) (Redundant method\*)**

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2018	2019	2020	2021	2022
TEOM	Suburban	0	0	8.7	8.8	9.4	10.3*	No data

**Notes:**

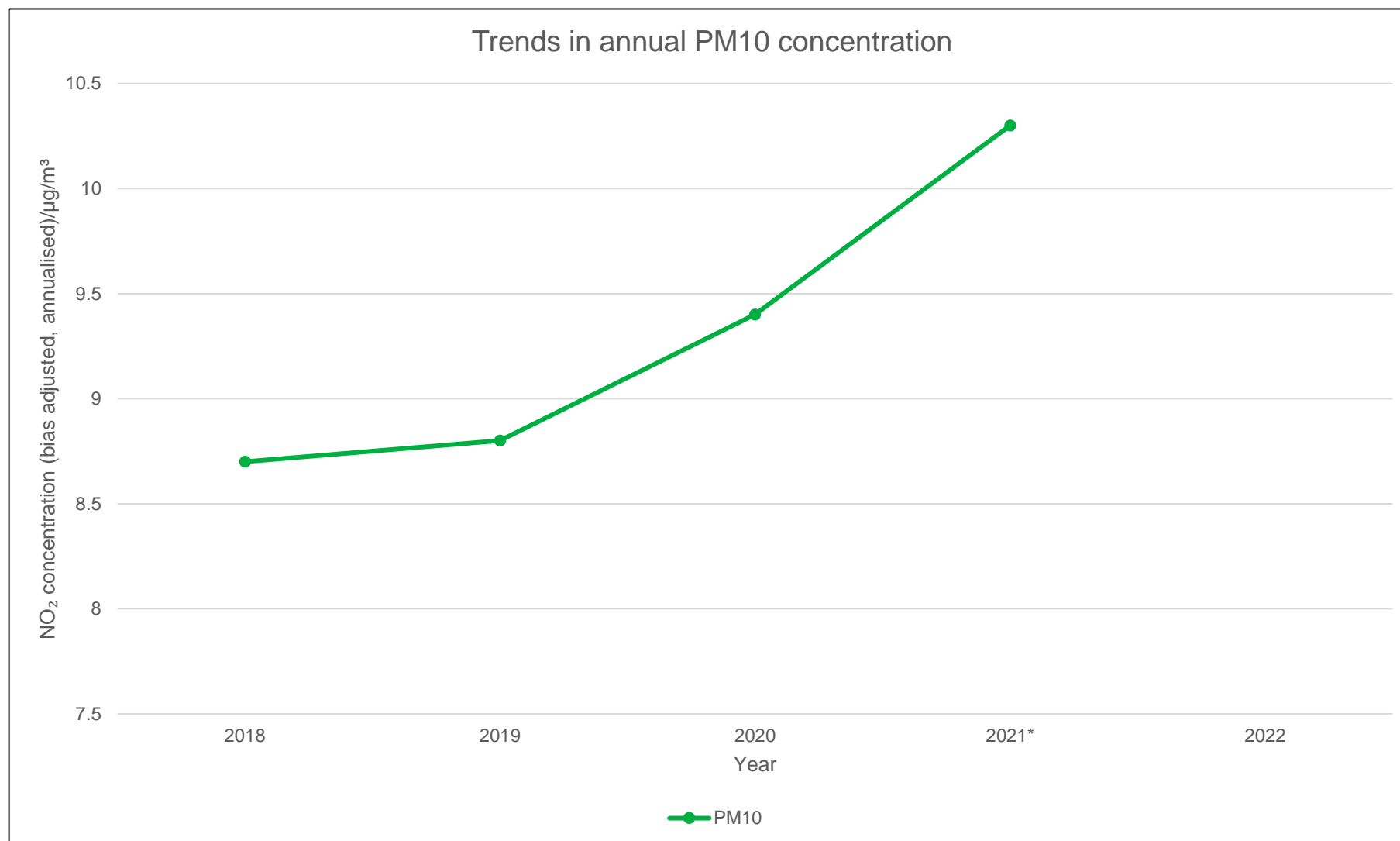
Exceedances of the PM<sub>10</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

All means have been “annualised” as per LAQM.TG22 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<sub>10</sub> Concentrations**

**\*Redundant correction method (see Appendix C)**

**Table 2.5 – 24-Hour Mean PM<sub>10</sub> Monitoring Results, Number of PM<sub>10</sub> 24-Hour Means > 50µg/m<sup>3</sup>**

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2018	2019	2020	2021	2022
TEOM	Suburban			0	0	0	0(19.3)*	No data

**Notes:**

Exceedances of the PM<sub>10</sub> 24-hour mean objective (50µg/m<sup>3</sup> not to be exceeded more than 35 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 90.4<sup>th</sup> 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 2.6 – PM<sub>2.5</sub> Monitoring Results (µg/m<sup>3</sup>)**

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2018	2019	2020	2021	2022
TEOM	Suburban			4.5	4.42	3.8	5.6(1)*	No data

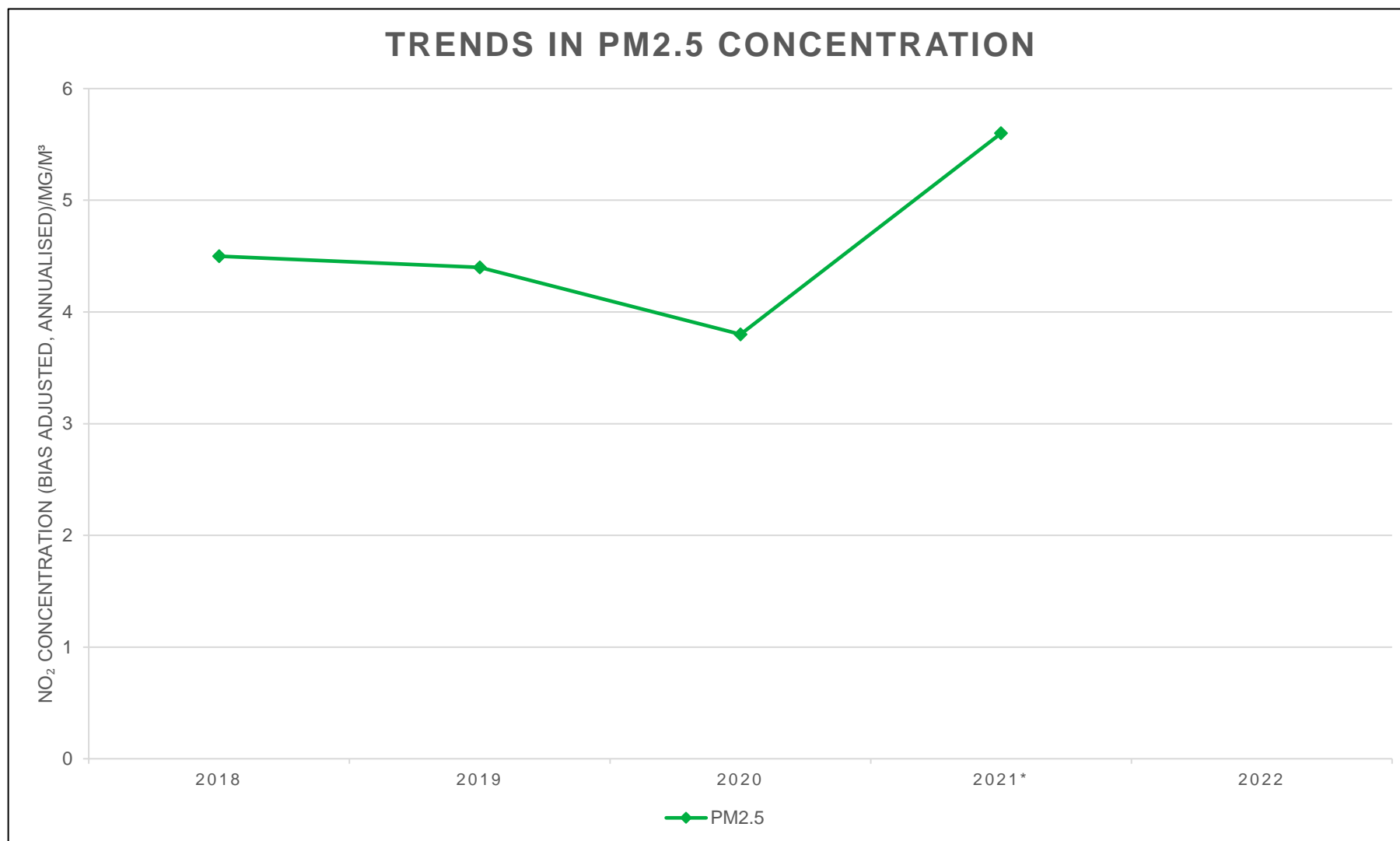
**Notes:**

All means have been “annualised” as per LAQM.TG22 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<sub>2.5</sub> Concentrations**

\* Redundant correction method (see Appendix C)

## Comparison of 2022 Monitoring Results with Previous Years and the Air Quality Objectives

### 2.1.3 Nitrogen Dioxide (NO<sub>2</sub>)

Generally, NO<sub>2</sub> concentrations have remained relatively stable over the previous 5 years with the exception of 2020 and have generally decreased overall as shown in Figure 2.3. Data for 2022 shows a decrease in NO<sub>2</sub> concentrations for 87% of all diffusion tube monitoring sites compared to 2019 and a decrease in NO<sub>2</sub> concentrations for 63% of all diffusion tube monitoring sites during 2021. Although there is less overall percentage reduction between 2022 against 2021 in comparison to 2022 against 2019, the largest percentage increase for any site was at 119 High Street corner at approximately a 12% increase from 2021 however, the concentration of 19.6µg/m<sup>3</sup> for 2022 remains well below the AQS objective of 40µg/m<sup>3</sup>.

Merthyr Tydfil County Borough Council is now in possession of at least 2 years' worth of robust data which demonstrates the effectiveness of the traffic reversal implemented as a result of the 2018 action plan, in terms of both a general decrease in NO<sub>2</sub> concentrations in the Twynrodyn area and demonstration that other routes such as Pontmorlais High Street have not been adversely impacted as a result.

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 have revealed this to be the case however, all sites including those within the AQMA remain more than 10% below the AQS objective of 40µg/m<sup>3</sup>. Due to prior indications that reductions in NO<sub>2</sub> would be sufficient to enable revocation of the AQMA, MTCBC intends to continue monitoring and plans to revoke the AQMA in 2024.

Concerns regarding diversions associated with the A465 dualling project have created some bottlenecking of traffic through Dowlais High Street causing backing up of traffic some way down the road. Although reports are largely 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**) has not recorded NO<sub>2</sub> concentrations of concerning levels. There has been a marginal increase from 2021 to 2022, with the annual mean concentration during 2021 being 21µg/m<sup>3</sup> compared to

21.3µg/m<sup>3</sup> for 2022 an approximate increase of 1%, still significantly below the 40µg/m<sup>3</sup> 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 did not yield valid data in terms of annual average or hourly concentrations. During 2022, the ECC monitor was operational for 40% of the year and as such, it has been possible to obtain data as a result of annualisation due to the low percentage capture (See Appendix C). It is worth noting that of the data recorded, there were no exceedances of the 200µg/m<sup>3</sup> 1-hour mean AQS objective.

Data from previous years have shown the correlation to diffusion tube data to be good however for 2022, once annualisation was carried out in respect of the ECC data, it showed an over-read of approximately 31% compared to the diffusion tube co-located at 98 Pontmorlais High Street, with the ECC showing an annual mean concentration of 24.7µg/m<sup>3</sup> compared to 17.1µg/m<sup>3</sup> for the co-located diffusion tube.

It should be noted that the ECC is not an established technology and is not a recognised and standardised approach to measuring annual NO<sub>2</sub> concentrations, 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 and potentially to monitor trends at Dowlais High Street.

Due to the extended periods where the ECC monitor has not provided continuous monitoring of NO<sub>2</sub>, the diffusion tube network is a more reliable method for long term monitoring and will continue to be the main approach taken by MTCBC.

14 of the 35 diffusion tube monitoring sites had less than a full calendar year of data capture due to missing tubes however, 21 of the 35 sites achieved 100% data capture for the year. Despite 40% of monitoring sites not achieving 100% data capture, all of that 40% achieved more than 75% data capture for the year and therefore it is not necessary to carry out annualisation. Further information regarding annualisation can be found in Appendix C.

For 2022, all diffusion tube sites were within the annual mean objective of 40µg/m<sup>3</sup> for NO<sub>2</sub> 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<sub>10</sub>)

PM<sub>10</sub> and PM<sub>2.5</sub> 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<sub>10</sub> 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 showed an increase in PM<sub>10</sub> concentrations with an average mean of 10.3µg/m<sup>3</sup> compared to 9.4µg/m<sup>3</sup> in 2020. The AQS objective for PM<sub>10</sub> is a maximum of 40µg/m<sup>3</sup> for annual mean concentrations and 50µg/m<sup>3</sup>, 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/m<sup>3</sup>. As there was only 82% valid data capture for 2021, it was necessary to report the 90.4<sup>th</sup> percentile. If the 90.4<sup>th</sup> percentile is greater than 50µg/m<sup>3</sup>, this indicates the objective has been breached. The 90.4<sup>th</sup> percentile for 2021 data was 19.3µg/m<sup>3</sup>.

Unfortunately, the TEOM developed technical faults in late 2021 hence the incomplete years' worth of data for 2021 mentioned above. Since that time the operator engaged Enviro Technology, with whom they have a service and repair contract, to investigate the monitor. It was revealed that the PM<sub>2.5</sub> section of the monitor was broken and whilst the PM<sub>10</sub> section was operational, there were issues with the data recorder and communications system used to download data. Tests carried out by Enviro Technology determined that the PM<sub>2.5</sub> and communications systems were beyond repair/replacement due to the age of the equipment. It was then determined that some components of BAMS equipment located in Rhymney could be retrofitted to the TEOM, including data loggers. The BAMS equipment was subsequently dismantled and subject to servicing before being installed in the TEOM at Twynyrodyn.

Data obtained for 2022 is problematic in terms of percentage of data capture for the year, being approximately 16% but also due to its erroneous nature. Typically, in a normal data set, it is not unusual for a small portion of the data to be erroneous, for example in the case of particulate monitoring, negative figures – it is not possible to have a negative number of particles. These would therefore be removed from the data prior to analysis to

prevent production of biased results. For the TEOM data received for 2022, 100% of it was erroneous in that it was significantly lower compared to data of previous years which could not reasonably be explained other than via the likelihood of it being due to faulty equipment.

**\*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**

### **2.1.5 Particulate Matter (PM<sub>2.5</sub>)**

PM<sub>2.5</sub> was reducing, but in 2017 it had increased, following the same pattern as PM<sub>10</sub>. It remained at a similar level in 2018 and 2019 but had decreased slightly. In 2020 the annual mean concentration of PM<sub>2.5</sub> had further reduced to 3.8µg/m<sup>3</sup>. There was 75% valid data capture for 2021 and has shown an increase in annual mean concentrations to 5.6µg/m<sup>3</sup> for 2021 (Table 2.7).

For 2022 the same issues affecting monitoring of PM<sub>10</sub> concentrations have affected monitoring of PM<sub>2.5</sub> concentrations and as such, there are no usable data for PM<sub>2.5</sub> concentrations from which any observations or conclusions can be made.

**It is important to note, that as for PM<sub>10</sub>, the PM<sub>2.5</sub> monitoring results are only an indication due to issues with data correction (see Appendix C).**

## **Summary of Compliance with AQS Objectives as of 2022**

Merthyr Tydfil County Borough Council has examined the results from monitoring in the Borough Concentrations are all below the Objectives, therefore no further action is required at this time.

Merthyr Tydfil County Borough Council Intends to Revoke the Twynyrodyn AQMA for Lack of Exceedance of Pollutant should continued monitoring demonstrate NO<sub>2</sub> remains at concentrations of more than 10% below the AQS objective.

### 3 New Local Developments

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. At this time there is one proposed development which includes an air quality assessment for which outline planning permission is being sought. This is the proposed mixed leisure development at Rhyd-y-car West comprising of an indoor snow centre, water park, outdoor activity centre and ancillary hotel accommodation. The air quality assessment indicates any contribution to increased concentrations of NO<sub>2</sub> would be negligible during the operation phase. Further comment will be made in future progress reports dependent on whether outline planning permission is granted resulting in submission of a full planning application, at which point the Environmental Health department will liaise with planners and the developer to investigate the potential effects on air quality in the Merthyr Tydfil Borough.

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/23/0065)

### Road Traffic Sources (and Other Transport)

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 since demonstrates 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 recorded concentration of NO<sub>2</sub> along Twynyrodyn Road was 30.4µg/m<sup>3</sup> at the 51 Twynyrodyn Road monitoring site, 24% below the AQS objective and a further 6% reduction from the previous year.

NO<sub>2</sub> monitoring stations along Pontmorlais High Street and many of the NO<sub>2</sub> stations along Twynyrodyn Road have been retained to determine whether the reversal has had the predicted effect. Monitoring through 2022 has further demonstrated that the reversal has been effective. Following the reversal, 5 diffusion tubes were relocated from the previous

network to provide additional monitoring on Union Street, Darren View, High Street, Pontmorlais High Street and Penydarren Road. The first 2 tubes were to monitor for changes caused by people taking back routes to avoid the traffic reversal and the remaining 3 were to monitor the reversal route for any potential breaches of the NO<sub>2</sub> annual mean AQS objective of 40µg/m<sup>3</sup>. Data for 2021 did not demonstrate any breaches of the AQS objective. Data for 2022 showed concentrations at Union Street and Darren View to be 11.1µg/m<sup>3</sup> and 13.7µg/m<sup>3</sup> respectively and the 3 tubes along Pontmorlais High Street: 98 Pontmorlais High Street, 110 Pontmorlais High Street and 119 Pontmorlais High Street have shown concentrations of 17.1µg/m<sup>3</sup>, 22.2µg/m<sup>3</sup> and 19.6µg/m<sup>3</sup> respectively. Pontmorlais High Street has a number of tall buildings and is a relatively narrow road in places (11.3m between buildings on opposite sides of the road) and there is the potential for a canyon effect. Notwithstanding, monitored concentrations have not revealed any breaches of either the annual mean AQS objective or the one hour mean limit of 200µg/m<sup>3</sup> (not to be exceeded >18 times per year).

### **Avenue de Clichy**

Following implementation of the traffic reversal, there was some concern regarding increased concentrations along Avenue de Clichy due to increased congestion. A build up of traffic along Avenue de Clichy was considered 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 distances that any deterioration in air quality will remain well below the AQS 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. Since its installation, it has not recorded NO<sub>2</sub> concentrations close to the AQS objective. Data for 2022 recorded concentrations at 17.5µg/m<sup>3</sup>, well below the AQS objective of 40µg/m<sup>3</sup>.

### **Merthyr Tydfil Bus Interchange Development**

As described in previous reports, the Merthyr Tydfil Bus Interchange Development became operational in June 2021. 4 additional diffusion tubes were added to the monitoring network to assess the effect of the newly located station on NO<sub>2</sub> concentrations. Data for 2022 at the 4 new monitoring locations; Swan Street, Picton House Swan Street, High Street Chapel and Graham Way River Walk showed that NO<sub>2</sub> concentrations at those sites to be 18.8µg/m<sup>3</sup>, 14.2µg/m<sup>3</sup>, 13.4µg/m<sup>3</sup> and 11.2µg/m<sup>3</sup> respectively. It is not anticipated that concentrations will increase to concerning levels.

## 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 concerns raised as a result of increased traffic queues through Dowlais. During 2021 the NO<sub>2</sub> concentration measured at the existing Dowlais monitoring location was 21µg/m<sup>3</sup>, whilst in 2022 the concentration at that site was 21.3µg/m<sup>3</sup>, a marginal increase and still well below the AQS objective.

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<sub>2</sub> will increase along diversionary routes. As this will be temporary, MTCBC are not considering any actions to reduce NO<sub>2</sub> 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 diversion and consequent deterioration in air quality are more significant or of longer duration than expected.

There were a small number of dust complaints in relation to the works during 2022. Whilst dust will contain fine particles i.e. PM<sub>10</sub> and PM<sub>2.5</sub>, it will also contain larger particles which are not as detrimental to health as very fine particles, due to their inability to be inhaled deep into the lungs. These larger and therefore heavier particles tend to deposit nearer to the source of the dust than finer ones, which are more likely to be carried further away or remain airborne. These larger particles are generally responsible for perceptible 'nuisance' dust and 'soiling' issues. It should be noted that there are no statutory standards or limits for dust deposition in the UK in relation to the tendency to cause nuisance. However, a threshold of 200mg/m<sup>2</sup>/day 'complaints likely' custom practice guideline has been adopted in the UK, although it is widely accepted in the available literature that this is very vague, based on old data and will not be reflective of local background conditions from one place to another. The lead contractor for the project, Future Valleys Construction (FVC) carried out dust monitoring between June and September 2022 with 88% data capture across 11 monitoring sites. Of the 7 monitoring

periods (each of 2 weeks duration) 2 sites exceeded the threshold for 2 of the monitoring periods and another site exceeded the threshold for 1 of the monitoring periods. The highest recorded deposition for any monitoring period was 293mg/m<sup>2</sup>/day. It is however, prudent to maintain a degree of caution due to the limitations of the adopted threshold described above.

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**

### **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 5<sup>th</sup> 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:

- Rhyd-y-car West mixed leisure development (see p.46)

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

## **4 Policies and Strategies Affecting Airborne Pollution**

### **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.

### **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.

## 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.

## **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.

## **Local Authorities Well-being Objectives**

Air pollution is considered in the well-being objectives, specifically in relation to the Twynnyrodyn 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 Twynnyrodyn 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<sub>2</sub>. 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 and 2022 have shown that all sites along Twynyrodyn Road have remained >10% below the AQS objective for NO<sub>2</sub>.

## **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.

## **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. At the time of writing, MTCBC have developed and published its 'Decarbonisation Plan 2023 – 2030' in line with the Welsh Government's objective mentioned above. Additionally, the Clean Air Bill for Wales proposes to lower AQS objectives for key pollutants.

## 5 Conclusion and Proposed Actions

### Conclusions from New Monitoring Data

Data for 2019 following implementation of the traffic flow reversal (post-period 6) showed a decrease in concentrations of NO<sub>2</sub> 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 concentration for 51 Twynyrodyn Road would fall to >10% below the AQS objective over the following year. Annual concentrations of NO<sub>2</sub> 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 did indeed show that the NO<sub>2</sub> concentration for 51 Twynyrodyn Road being 33µg/m<sup>3</sup> for that year had reduced to >10% below the AQS objective. There has been a further reduction of the annual mean NO<sub>2</sub> concentration at 51 Twynyrodyn Road for 2022 being 30.4µg/m<sup>3</sup>, 24% below the AQS objective.

Legacy impacts of the pandemic appeared 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. It was therefore determined that the AQMA should remain in place for continued monitoring to obtain a sufficiently longer-term dataset from which future decisions regarding the AQMA can be made. MTCBC is presently in a possession of 2 full years of data which demonstrates compliance with the AQS objective and as such plans to revoke the AQMA in 2024 by which time 3 years of data will be available. This is based on the assumption that data for 2023 will also be compliant with the AQS objective. Should this not be the case, then MTCBC will need to delay revocation of the AQMA pending further investigation and development of future air quality management plans.

Previous reports highlighted congestion and year on year exceedances of the NO<sub>2</sub> 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 concentration of NO<sub>2</sub>. NO<sub>2</sub> concentrations for 6/7 Ladysmith Place for 2021 were 28.8µg/m<sup>3</sup> and 26.3µg/m<sup>3</sup> for 2022, a further reduction. 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.

## Conclusions relating to New Local Developments

The development of most concern in terms of air quality is the continued dualling of the A465 and its associated diversions. The works are scheduled for completion during 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, Twynirodyn, 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 concentrations of NO<sub>2</sub> or if the public raise health concerns that warrant investigation. Concerns have been raised in Dowlais as a result of increased traffic queues however, the monitoring location along the road has not to date recorded any exceedances of the AQS objective.

## Other Conclusions

As discussed in this and previous reports, further monitoring was 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 and 2022 have demonstrated all sites within the Borough are >10% below the AQS objective, MTCBC's aim has been to obtain sufficient longer-term data in this respect before considering revocation of the AQMA. Monitoring continues at all sites through 2023 and exceedances are not anticipated. Should this be the case then it will be considered feasible to revoke the AQMA in 2024. Consultation will be carried out to ensure there is minimal possibility that a further AQMA would need to be declared again in the Twynirodyn 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.

## Proposed Actions

The following actions are proposed to address air quality:

- No new AQMA's will be declared in 2023.
- MTCBC plans to revoke the existing AQMA in 2024 should data for 2023 show compliance with the AQS objective in addition to there being no monitoring sites within the AQMA which are within 10% of the AQS objective. This will mean MTCBC will be in possession of 3 full years of data demonstrating compliance with the AQS objective.
- Monthly monitoring data to date from 6/7 Ladysmith Place indicates that although bottlenecks exist, the NO<sub>2</sub> 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 installed around the vicinity of the new bus interchange and will remain in place for at least a further 2 years. Although at the time of writing concentrations have been well within the AQS objective. Should concentrations of NO<sub>2</sub> reach concerning levels, action may be considered in any future action plan.
- NO<sub>2</sub> 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

<b>Title</b>	<b>Author</b>	<b>Date</b>
<b>Particulate Measurement at Twynyrodyn Primary School site – 2022 data</b>	Merthyr (Ffos-y-Fran) Ltd	2022
<b>Detailed Assessment of Air Quality at Twynyrodyn Road, Merthyr Tydfil</b>	AQC for MTCBC	2009
<b>South East Valleys Local Transport Plan</b>	Blaenau Gwent CBC; Caerphilly CBC; Merthyr Tydfil CBC; Rhondda Cynon Taff CBC; and Torfaen CBC	2015
<b>Local Air Quality Management – Technical Guidance LAQM (TG22)</b>	DEFRA	2022
<b>National Diffusion Tube Bias Adjustment Factor Spreadsheet (06/23)</b>	DEFRA	2023
<b>LAQM Helpdesk June 2022: Summary of laboratory performance in AIR NO<sub>2</sub> proficiency testing scheme May 2020 – June 2022</b>	LAQM	2022
<b>First Stage Review and Assessment</b>	MTCBC	1998
<b>Second Stage Review and Assessment</b>	MTCBC	2000
<b>Progress Report</b>	MTCBC	2004
<b>Updating and Screening Assessment</b>	MTCBC	2004
<b>Progress Report</b>	MTCBC	2005

<b>Updating and Screening Assessment</b>	MTCBC	2006
<b>Progress Report</b>	MTCBC	2007
<b>Progress Report</b>	MTCBC	2008
<b>Updating and Screening Assessment</b>	MTCBC	2009
<b>Progress Report</b>	MTCBC	2010
<b>Progress Report</b>	MTCBC	2011
<b>Updating and Screening Assessment</b>	MTCBC	2012
<b>Progress Report</b>	MTCBC	2013
<b>Progress Report</b>	MTCBC	2014
<b>Detailed Assessment of Air Quality at Twynyrodyn Road, Merthyr Tydfil</b>	MTCBC	2015
<b>Updating and Screening Assessment</b>	MTCBC	2015
<b>Progress Report</b>	MTCBC	2016
<b>Progress Report</b>	MTCBC	2017
<b>Annual Progress Report</b>	MTCBC	2018
<b>Annual Progress Report</b>	MTCBC	2019
<b>Annual Progress Report</b>	MTCBC	2020
<b>Annual Progress Report</b>	MTCBC	2021
<b>Annual Progress Report</b>	MTCBC	2022
<b>First Replacement Local Development Plan 2016-2031</b>	MTCBC	2018
<b>Focus on the Future: Wellbeing in our Community 2017-2022</b>	MTCBC	2018

<b>Wellbeing of Future Generations (Wales) Act 2015</b>	Welsh Government	2015
<b>Metro: Rolling out our Metro</b>	Welsh Government	
<b>A New Wales Transport Strategy: 2021</b>	Welsh Government	2021
<b>Merthyr Tydfil County Borough Council Decarbonisation Plan 2023 - 2030</b>	MTCBC	2023
<b>Technical Guidance Note (M17) – Monitoring Particulate Matter in Ambient Air around Waste Facilities</b>	Environment Agency	2013
<b>Guidance on the assessment of dust from demolition and construction Version 1.1</b>	IAQM (Institute of air Quality Management)	2014

## 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 2022 ( $\mu\text{g}/\text{m}^3$ )**

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.76) and Annualised <sup>(1)</sup>	Distance Corrected to Nearest Exposure <sup>(2)</sup>
1	52.3	37.5	31.2	29.4	27.2	25.4	29.4	32.6	26.7	27.3	45	42.7	33.9	25.8	25.8
2	28.1	15.4	21.8	13.3	-	10.3	11.8	11.8	11.9	15.8	22.5	22.7	16.9	12.8	12.8
3	21.4	10.8	13.9	11.0	7.0	7.6	-	10.6	8.1	10.0	15.7	16.7	12.1	9.2	9.2
4	43.3	25.3	32.7	-	23.0	21.6	27.1	28.9	27.7	28.2	39.6	37.9	30.5	23.2	23.2
5	29.4	21.3	20.7	19.4	16.6	14.1	17.3	19.1	15.0	19.3	26.4	27.4	20.5	15.6	15.6
6	39.8	27.0	22.0	20.7	19.7	18.9	19.8	21.4	22.0	24.3	32.4	31.6	25.0	19.0	19.0
7	33.7	15.8	20.8	16.8	12.5	11.7	13.8	15.03	13.4	15.8	23.6	23.2	18.0	13.7	13.7
8	33.9	16.6	20.5	16.3	-	10.8	13.1	16.0	16.5	15.3	25.3	26.0	19.1	14.5	14.5
9	22.5	8.1	11.4	8.7	5.0	4.6	6.4	7.7	5.7	6.8	12.3	-	9.0	6.9	6.9
10	57.4	38.3	44.9	37.4	30.4	-	34.6	36.8	31.4	39.2	49.7	49.2	40.8	31.0	31.0
11	54.3	33.7	37.1	-	-	31.1	34.3	42.3	35.7	28.5	39.6	39.8	37.5	28.5	28.5
12	45.5	23.4	35.3	30.9	21.8	19.4	23.2	29.9	25.2	20.7	28.4	32.8	28.0	21.3	21.3
13	36.7	28.5	26.3	27.6	24.5	23.0	27.1	27.1	26.3	26.7	40.3	37.2	29.3	22.2	22.2
14	51.1	32.8	41.2	36.8	29.0	26.5	32.4	36.7	32.3	25.9	38.3	41.2	35.4	26.9	26.9
15	24.7	12.1	12.9	10.5	8.5	7.3	10.4	9.7	8.0	10.9	18.4	17.0	12.5	9.5	9.5
16	24.5	10.8	14.9	11.1	8.6	7.5	9.7	10.9	8.4	9.9	18.9	17.3	12.7	9.7	9.7
17	43.2	27.5	25.8	23.3	20.5	19.4	22.2	23.9	23.3	22.9	-	32.2	25.8	19.6	19.6
18	39.3	27.8	29.0	26.6	23.5	20.2	25.2	25.0	22.8	23.3	32.6	35.7	27.6	21.0	21.0
19	38.3	22.3	23.0	19.6	16.8	15.9	16.8	18.4	16.1	18.6	23.9	28.5	21.5	16.4	16.4
20	42.7	27.7	36.4	31.6	23.9	20.6	27.4	32.2	31.6	28.1	36.2	37.2	31.3	23.8	23.8
21	68.6	-	41.3	34.8	32.8	30.4	38.3	40.0	39.7	27.0	44.6	42.4	40.0	30.4	30.4
22	47.1	28.6	34.3	25.7	25.0	22.4	28.0	26.6	25.2	29.5	34.1	34.6	30.1	22.9	22.9
23	32.6	19.3	27.8	23.4	16.4	15.8	17.8	22.6	18.4	21.0	28.4	26.0	22.5	17.1	17.1
24	26.0	21.6	25.0	22.2	15.7	15.1	17.5	20.9	18.8	20.7	29.2	30.6	21.9	16.7	16.7
25	49.1	31.9	33.3	26.5	23.7	21.9	24.9	25.4	22.5	27.8	39.2	34.8	30.1	22.9	22.9
26	31.8	18.3	22.4	-	15.3	12.3	13.1	13.7	14.5	18.0	25.0	23.8	18.9	14.4	14.4
27	29.5	14.7	16.6	12.4	8.9	7.4	10.6	11.4	10.3	13.0	20.0	21.2	14.7	11.1	11.1

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.76) and Annualised <sup>(1)</sup>	Distance Corrected to Nearest Exposure <sup>(2)</sup>
28	28.7	17.3	21.2	16.5	12.6	11.8	13.0	14.2	14.7	17.1	25.4	23.8	18.0	13.7	13.7
29	58.2	39.0	37.4	31.6	29.8	27.8	29.8	29.9	21.7	32.3	37.0	40.0	34.8	26.3	26.3
30	32.4	19.9	25.2	22.2	15.0	13.6	17.8	20.3	18.6	23.1	31.8	29.1	22.4	17.0	17.0
31	32.5	20.3	28.2	19.9	16.3	16.0	18.8	22.3	19.2	21.8	32.3	29.0	23.1	17.5	17.5
32	26.1	25.6	-	22.9	17.8	17.3	20.6	22.2	22.1	24.7	31.1	31.5	24.7	18.8	18.8
33	31.4	20.0	-	15.4	16.3	12.4	13.9	15.9	15.2	17.8	25.6	24.2	18.7	14.2	14.2
34	32.7	17.6	-	15.6	-	12.0	13.7	11.5	11.5	13.4	25.9	22.9	17.7	13.4	13.4
35	27.6	13.2	-	12.6	9.0	9.1	10.4	11.9	12.1	13.7	12.4	20.8	14.7	11.2	11.2

**Notes:**

Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 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, as amended by the Environment Act 2021, 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 must then be reviewed and updated no later than every five years; or if a local authority considers there is a need for further or different measures to be taken in order to achieve air quality standards; or if significant changes to sources occur within your local area.

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  $\mu\text{g}/\text{m}^3$  (milligrams per cubic metre,  $\text{mg}/\text{m}^3$  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**

<b>Pollutant</b>	<b>Air Quality Objective: Concentration</b>	<b>Air Quality Objective: Measured as</b>	<b>Date to be achieved by</b>
<b>Nitrogen Dioxide (NO<sub>2</sub>)</b>	200µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
<b>Nitrogen Dioxide (NO<sub>2</sub>)</b>	40µg/m <sup>3</sup>	Annual mean	31.12.2005
<b>Particulate Matter (PM<sub>10</sub>)</b>	50µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	24-hour mean	31.12.2010
<b>Particulate Matter (PM<sub>10</sub>)</b>	40µg/m <sup>3</sup>	Annual mean	31.12.2010
<b>Sulphur dioxide (SO<sub>2</sub>)</b>	350µg/m <sup>3</sup> , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
<b>Sulphur dioxide (SO<sub>2</sub>)</b>	125µg/m <sup>3</sup> , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
<b>Sulphur dioxide (SO<sub>2</sub>)</b>	266µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
<b>Benzene</b>	16.25µg/m <sup>3</sup>	Running annual mean	31.12.2003
<b>Benzene</b>	5µg/m <sup>3</sup>	Annual mean	31 12 2010
<b>1,3 Butadiene</b>	2.25µg/m <sup>3</sup>	Running annual mean	31.12.2003
<b>Carbon Monoxide</b>	10.0mg/m <sup>3</sup>	Maximum Daily Running 8-Hour mean	31.12.2003
<b>Lead</b>	0.25µg/m <sup>3</sup>	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 absorbent is analysed for NO<sub>2</sub> 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 2022 good precision was found in 27 out of 27 co-location studies. As such the precision for diffusion tubes used in Merthyr Tydfil County Borough is considered good.

Socotec UK are UKAS accredited and participate in the AIR PT NO<sub>2</sub> 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<sub>2</sub> 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 the most recent rounds of testing available (rounds 49 and 50: January – February 2022 and May – June 2022), Socotec for 100% 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 4, 8 and 10 which were installed +2; +1; +1 days beyond the due date respectively. 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

All diffusion tube monitoring locations within Merthyr Tydfil County Borough recorded data capture of more than 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

## Diffusion Tube Bias Adjustment Factors

Diffusion tubes may systematically under or over-read NO<sub>2</sub> 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 0.76 has been applied to the 2022 monitoring data and was obtained from National Diffusion Tube Bias Adjustment Factor Spreadsheet: Spreadsheet Version Number: 06/23. 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/air-quality/air-quality-assessment/national-bias/>. 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
2022	National	06/23	<b>0.76</b>
2021	National	09/22	0.78

2020	National	06/21	0.76
2019	National	09/20	0.75
2018	National	06/19	0.76

### **NO<sub>2</sub> Fall-off with Distance from the Road**

No diffusion tube NO<sub>2</sub> monitoring locations within Merthyr Tydfil County Borough Council area required distance correction during 2022.

### **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 that the sensors can fail in cold, damp conditions and this should be checked for to enable fast replacement and to minimise data loss.

Co-location 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<sub>2</sub>, rather than as an accurate NO<sub>2</sub> 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 had over-read by around +14%. During 2020 the ECC, which was re-located to 98 Pontmorlais High Street on 11<sup>th</sup> 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 was available on which to comment. During 2022 the monitor was operational for 40% of the year and showed over-reading of +23% compared to the co-located diffusion tube. 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<sub>2</sub> concentration.

### **PM<sub>10</sub> and PM<sub>2.5</sub> 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 was 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. As no usable data was obtained for 2022, no data correction has been carried out for the monitoring period.

### **Automatic Monitoring Annualisation**

Annualisation is required for any site with data capture less than 75% but greater than 25%. As the ECC sited at Pontmorlais High Street was operational for only 40% of 2022, it has been necessary to annualise the available data. The calculation for annualising continuous monitoring data was derived from the Local Air Quality Management: Technical Guidance (TG22) which requires the use of data from 2 -4 nearby long-term, continuous

monitoring sites (ideally those forming part of the national network). Four sites forming part of the national network were identified and data obtained:

- Blackwood High Street (Caerphilly County Borough)
- Islwyn Road, Wattsville (Caerphilly County Borough)
- Broadway (Rhondda Cynon Taff)
- Gelliwastad Road (Rhondda Cynon Taff)

As required by the Technical Guidance, data capture for each of the above continuous monitors was >85% for the monitoring period. Additionally, all sites lie within a 50 mile radius of Merthyr Tydfil County Borough. Typically, sites deemed 'Urban Background', 'Suburban' or 'Rural' should be utilised for annualisation however it is acceptable to use those deemed 'Urban Centre', 'Roadside' or 'Kerbside' where the site requiring annualisation, in this case the ECC monitor located at Pontmorlais High Street, is itself an equivalent type. Annualisation data is presented in **Table C.2**.

### **NO<sub>2</sub> Fall-off with Distance from the Road**

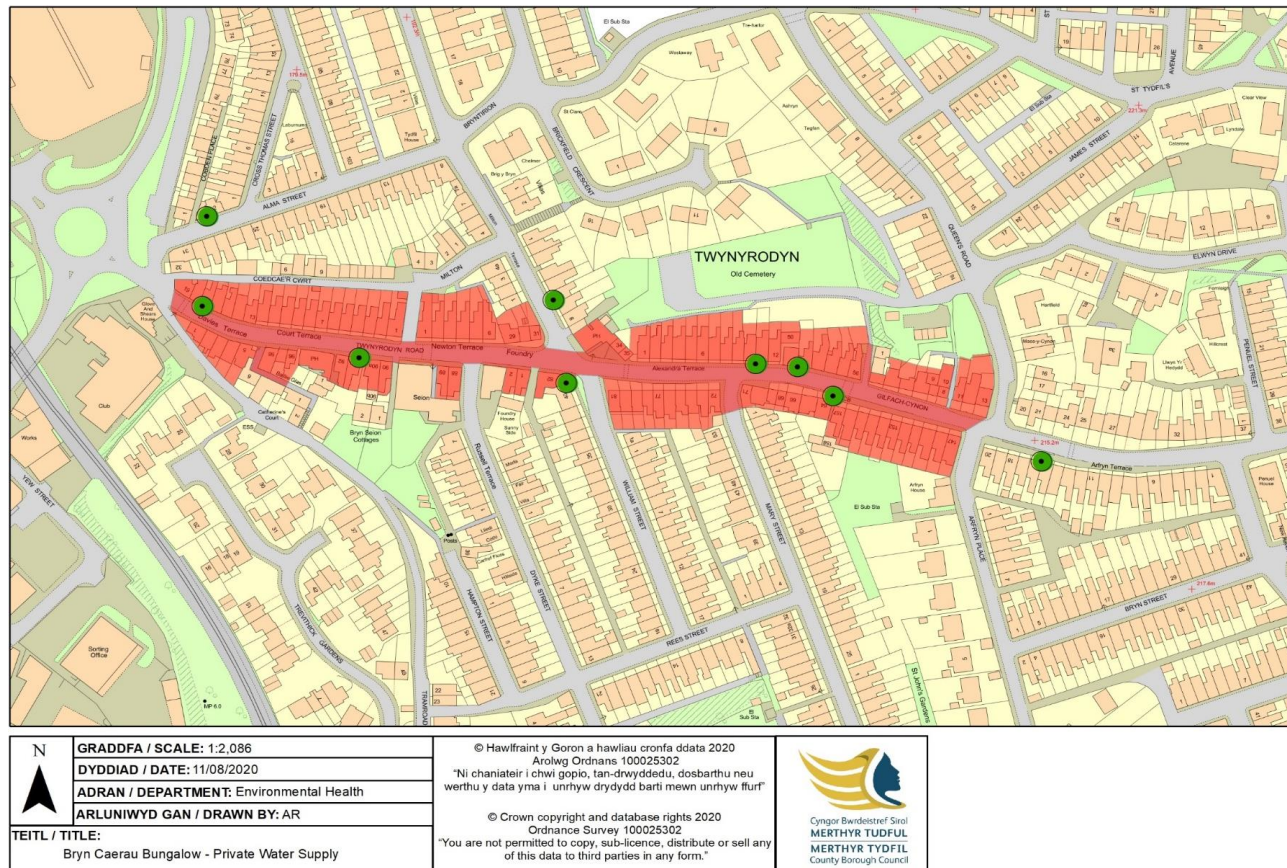
No automatic NO<sub>2</sub> monitoring locations within Merthyr Tydfil County Borough Council area required distance correction during 2022.

Table C.2 – Annualisation Summary (NO<sub>2</sub> concentrations presented in µg/m<sup>3</sup>)

Site ID	Annualisation Factor Site 1 Blackwood High Street	Annualisation Factor Site 2 Islwyn Road, Wattsville	Annualisation Factor Site 3 Broadway, RCT	Annualisation Factor Site 4 Gelliwastad Road, RCT	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
<b>ECC</b> Pontmorlais High Street	0.79	0.79	0.77	0.76	0.78	31.7	24.7	As no 'Urban Background'; 'Suburban' or 'Rural' equivalent continuous monitoring data was available within a 50 mile radius, the sites used for annualisation are all 'Roadside' or 'Kerbside'. As the ECC in Merthyr Tydfil Borough is itself a 'Roadside' location, this is considered acceptable (ref: Local Air Quality Management Technical Guidance (TG22)).

## Appendix D: AQMA Boundary Maps

Figure D.1 –



<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 <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM <sub>2.5</sub>	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO <sub>2</sub>	Sulphur Dioxide