Monmouthshire County Council
2019 Air Quality Progress Report
In fulfillment of Part IV of the Environment Act 1995
Local Air Quality Management

September 2019

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Executive Summary: Air Quality in Our Area

Air Quality in Monmouthshire

Generally air quality in Monmouthshire is good, however there are some hotspots of poor air quality close to busy or congested roads. As such these roads are monitored closely for nitrogen dioxide, which is one of the main pollutants from vehicle emissions.

In 2018 this monitoring was undertaken at 42 locations with nitrogen dioxide diffusion tubes along the road network , one location with automatic analysers for nitrogen dioxide, and particulate matter (both PM_{10} and $PM_{2.5}$) (on the pavement of the A48 in Chepstow), and two school's with ambient air quality sensors for nitrogen dioxide, sulphur dioxide, carbon monoxide and ozone.

This Annual Progress Report (APR) presents the results of the air quality monitoring undertaken by Monmouthshire County Council in 2018. Previous reports (2011 to 2018) are available on the Councils website - http://www.monmouthshire.gov.uk/air-quality.

In 2018 monitoring was undertaken long roads in Chepstow, Pwllmeyric, Usk, Woodside, Monmouth and Abergavenny. In addition, sensors were installed at two schools located adjacent to Air Quality Management Areas (AQMA). One is just outside the Usk AQMA and one outside the Chepstow AQMA (see below).

Previously monitored locations that were discontinued when it became clear that the relevant air quality objective levels were not in danger of being exceeded include - Raglan, Caldicot, Undy and Magor.

There are two roads in Monmouthshire that have been declared Air Quality Management Areas (AQMA) due to having exceeded the nitrogen dioxide annual mean objective level in the past :-

- Bridge Street in Usk
- Hardwick Hill (A48) in Chepstow

Both of these AQMA's have Action Plans and Steering Groups set up to identify options for improving air quality, the Action Plans are available from the above website and the DEFRA website for the AQMA's is at the following website:-

https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=403

The three analysers housed within the Chepstow Air Quality Monitoring Station (AQMA) continuously monitor nitrogen dioxide, PM_{10} and $PM_{2.5}$. The station is located within the Air Quality Management Area on the pavement of Hardwick Hill. Hardwick Hill is a steep section of the A48 that runs through Chepstow.

In 2018, there were no exceedances of any of the short or long-term air quality objective levels of any the three pollutants.

In Chepstow there was one exceedance of the nitrogen dioxide annual mean objective level recorded by diffusion tube. This location is on Hardwick Hill, and has exceeded every year. Whilst it decreased in 2018 to its lowest concentration to date, it remains the highest location for nitrogen dioxide at a relevant receptor in the county.

With regard to the Usk AQMA - 2018 was the fourth continuous year with no exceedance of the nitrogen dioxide annual mean objective level in the town.

There were no recorded exceedances in Monmouth, Abergavenny or Woodside, and monitoring in Pwllmeyric only started in October 2018, therefore there will not be enough data to compare to the annual mean until early 2020, however the four-month average at relevant receptors was below the nitrogen dioxide objective level.

Across Monmouthshire, almost all nitrogen dioxide monitored locations were lower in 2018 than any of year since monitoring began. Air Quality in Monmouthshire has improved since 2012. In 2012, nitrogen dioxide levels were at their highest concentrations to date, and there was a trend since 2007 of increased concentrations year on year. However, from 2013, and with the exception of 2014, concentrations started reducing or remaining stable and there now appears to be a trend of decreasing nitrogen dioxide levels.

There is also a trend of decreasing PM_{10} and $PM_{2.5}$ concentrations since monitoring began at the Chepstow Air Quality Monitoring Station. There was a large decrease between 2005 and 2012, but concentrations have since remained stable at around 17 $\mu g/m^3$ for PM_{10}, and 10$\mu g/m^3$ for $PM_{2.5}$. Nitrogen dioxide at the station has seen some annual increases and decreases, with exceedances of the annual objective level of 40 $\mu g/m^3$ in 2008 and 2011 (41.9 $\mu g/m^3$ and 40 $\mu g/m^3$ respectively) but has generally remained around 35 $\mu g/m^3$ since 2005.

There were no new industrial installations and no new or substantially altered roads within Monmouthshire. In 2018

There were no newly identified commercial, domestic or fugitive sources of emissions.

The APR summarises progress with both the Chepstow and Usk Action Plans.

No further Detailed Assessments are required at present, although Merthyr Road in Abergavenny and parts of Monmouth will continue to be monitored closely along with the Usk and Chepstow Air Quality Management Areas.

The nitrogen dioxide diffusion tube monitoring that was extended along the southern boundary of the Usk AQMA in 2017 into the Woodside area, did not identify an exceedance in 2017 or 2018; however monitoring will continue for one more year in 2019.

The Chepstow diffusion tube monitoring network was extended south west of the AQMA into Pwllmeyric in October 2018 to monitor a busy section of the A48 that leads to Chepstow. As only 3 months of data was obtained in 2018, firm conclusions cannot yet be drawn. However, it appears that whilst the north-east carriage way into Chepstow (uphill) has high concentrations roadside/kerbside, houses are set back a fair distance and thus the distance corrected concentrations to the receptors are not excessive. The southwest carriageway out of Chepstow is downhill, and houses are set much closer to the roadside, however concentrations recorded are also considerably lower.

Monmouthshire County Council has in 2018 prioritised air quality monitoring at certain schools (including Chepstow Comprehensive and Usk Primary – which are both outside the AQMA's). The sensors were installed in September/October 2018 and initial concentrations indicate that the schools are not at risk of exceeding the air quality objective levels. Monitoring is continuing into 2019 to obtain a full calendar year of data to be reported in 2020 APR.

Actions to Improve Air Quality

Actions to improve air quality in the AQMA's can be found in section 1.

Local Priorities and Challenges

Local air quality priorities are to continue to work within the two air quality management area steering groups to attempt to reduce nitrogen dioxide emissions, and to implement air quality monitoring at four schools using air quality sensors.

Challenges in improving air quality are many, but are related to the ever increasing traffic on local roads due to pressure to build new houses both within Monmouthshire and in neighbouring local authorities (specifically in Forest of Dean) and the removal of the Severn Bridge Tolls (which are thought to being additional commuter traffic into the south of the County.

How to Get Involved

Further information on air quality can be found at –

http://www.monmouthshire.gov.uk/air-quality

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1. Actions to Improve Air Quality

1.1 Previous Work in Relation to Air Quality

Table 1.1 is a chronological summary of previous air quality reports from 2003 until 2018. Further detail on each report can be found in the previous reports available on Monmouthshire County Council's website.

Table 1.2   **A chronological summary of previous air quality reports**

Report Name	Date	Outcome
Updating and Screening Assessment (Round 2)	**June 2003**	**Detailed Assessment required for nitrogen dioxide at four roadside locations. Two in Monmouth, and one each in Usk and Chepstow**
Interim Detailed Assessment (9 months monitoring)	November 2004	AQMA required for Bridge Street in Usk. Chepstow and Monmouth monitoring results were marginal and AQMA's not declared
Detailed Assessment (12 months monitoring)	February 2005	AQMA for Usk confirmed. Chepstow and Monmouth did not require an AQMA
Progress Report	May 2005	Confirmed nitrogen dioxide exceedance in Usk. Elsewhere levels were below the objective levels for all pollutants although Hardwick Hill in Chepstow was close
AQMA declared for Bridge Street, Usk	November 2005	The location is shown in Figure 1.1.
Updating and Screening Assessment (Round 3)	**March 2006**	**Exceedances of Nitrogen Dioxide level on Hardwick Hill, Chepstow. Decided to progress straight to declaration of an AQMA**
AQMA declared for Hardwick Hill, Chepstow	April 2007	The location is shown in Figure 1.2

Further Assessment for Usk AQMA	April 2007	Confirmed the AQMA should be retained with no changes to the boundary
Further Assessment for Chepstow AQMA	May 2008	One exceedance of ten monitoring locations representing 8 residential properties. Rather than cycle between increasing and decreasing boundaries it was decided to keep the original AQMA boundary
Progress Report	November 2008	NO2 exceedances limited to the two AQMA's.
Updating and Screening Assessment (Round 4)	**May 2009**	**Little changed in source emissions since 2006. A detailed Assessment was not necessary. Additional monitoring undertaken in Magor/Undy along the proposed route of the M4 relief road for 12 months to give a baseline**
Usk Air Quality Action Plan	September 2009	Agreed by Welsh Assembly Government on November 2009. 14 proposed measures to improve air quality
Chepstow Action Plan Stakeholder workshop Report	November 2009	Outcomes of two stakeholder workshops with local residents
Progress Report	May 2010	Only the two AQMA's exceeded nitrogen dioxide objective levels. No Detailed Assessment required.
Hardwick Hill, Chepstow Origin & Destination Study	August 2010	Undertaken to support the Action Plan process
Progress Report	June 2011	Nitrogen dioxide is still the only pollutant that exceeds the objective level, and these exceedances are contained in the two declared AQMAs in Usk and Chepstow. It concluded that a Detailed Assessment for air quality within Monmouthshire was not necessary for any pollutant
Chepstow Air Quality Action Plan	August 2011	Accepted by the Welsh Government in September 2011 with 29 proposed measure for improving air quality

| Updating and Screening Assessment (Round 5) | April 2012 | Air quality within Monmouthshire continues to meet the relevant air quality objectives outside of the declared AQMAs however levels at Merthyr Road Abergavenny were close to the objective level. Within the AQMAs there are still exceedances of the nitrogen dioxide objective at Hardwick Hill, Chepstow and Bridge Street, Usk. A Detailed Assessment was not required; however, it was decided to increase monitoring on Merthyr Road from one to three locations. These were installed mid-2012.

Further details below |
| --- | --- | --- |
| Progress Report | April 2013 | Nitrogen dioxide was still the only pollutant that exceeded the objective level. The two Air Quality Management Areas still exceeded.

Nitrogen Dioxide levels across the County increased sharply in 2012, which lead to Wyebridge Street in Monmouth being close to the objective level, and Merthyr Road in Abergavenny slightly exceeding the objective level.

A Detailed Assessment was not undertaken, as it was decided that the results of the 2013 monitoring would be required to ensure 2012 was not an unusually high year. To support this and in preparation for a potential Detailed Assessment for Merthyr Road, an additional three diffusion tubes were to be installed on Merthyr road (to increase monitoring from one in 2011, to three in 2012, and six in 2013. |
| Progress Report | April 2014 | Nitrogen dioxide was still the only pollutant that exceeded the objective level. The two Air Quality Management Areas still exceeded.

Nitrogen dioxide levels were lower in 2013 than 2012 at all but one location and no location outside the two AQMA's exceeded the objective level. It was decided that a further 13 diffusion tubes were to be installed in Monmouth at the end of 2013 in preparation for the 2014 monitoring year. These were installed to support a more detailed assessment of nitrogen dioxide levels in the town centre and along the A40. |

Monmouth Six Month Detailed Assessment	September 2014	The report provided a summary of monitoring data for the period January–July 2014 and indicated that the annual mean objective was likely to be met at all sites. However, an assessment of two Air Quality Models undertaken for developments under the planning process identified possible exceedances elsewhere in the town. It was decided to install further diffusion tubes at these locations in January 2015, and to liaise with Natural Resources Wales to install an automatic monitoring station for NO2 and PM10, PM2.5 on the pavement of Wyebridge Street.
Updating and Screening Assessment (Round 6)	**April 2015**	**The two AQMA's continued to experience exceedances of the nitrogen dioxide annual mean at two locations in each town. Concentrations in 2014 were fairly similar to those recorded in 2013 (which had seen a decrease from 2012). There were no exceedances outside the AQMA's**
		The full year's monitoring for Monmouth had confirmed the findings of the September 2014 six-month Detailed Assessment.
		The USA confirmed that further diffusion tube monitoring was being undertaken in 2015 in Monmouth, and that the NRW's MMF had also been installed in December 2014.
		There were no exceedances of nitrogen dioxide in Abergavenny, although two locations were close enough to warrant continued monitoring.
Progress Report 2016	April 2016	Nitrogen dioxide, PM10 and PM2.5 concentrations decreased at all locations (diffusion tube and automatic analysers). One location exceeded the nitrogen dioxide annual mean in the Chepstow AQMA, there were no other exceedances (including the Usk AQMA). This was the first year Usk did not have a location exceeding the objective level.
		NRW's MMF monitoring in Monmouth was also summarised. It did not identify exceedance at a relevant receptor.
Progress Report 2017	September 2017	This PR confirms that air quality within the Chepstow Air Quality Management Area (AQMA) continues to exceed the nitrogen dioxide annual mean objective level at one location, however

		for the second year all six monitoring locations the Usk AQMA were below the nitrogen dioxide annual mean objective level. There were no recorded exceedances in Monmouth or Abergavenny.
Annual Progress Report 2018	September 2018	Air Quality within the Chepstow AQMA continues to exceed the nitrogen dioxide annual mean objective level at one location. Third year with no exceedance in Usk AQMA. No exceedances elsewhere. Concentrations broadly similar to 2017. Additional monitoring undertaken in Woodside south of Usk AQMA.

1.2   Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when air quality is close to or above an acceptable level of pollution (known as the air quality objective (Please see Appendix A)). After declaring an AQMA the authority must prepare an Air Quality Action Plan (AQAP) within 18 months setting out measures it intends to put in place to improve air quality to at least the air quality objectives, if not even better. 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 AQMAs declared by Monmouthshire County Council can be found in Table 1.1.

Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at http://www.monmouthshire.gov.uk/air-quality and

https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=403

Table 1.1 – Declared Air Quality Management Areas

AQMA	Relevant Air Quality Objective(s)	Comments on Air Quality Trend	Description	Action Plan
Bridge Street, Usk	NO$_2$ annual mean	There have been improvements in air quality in the AQMA over the last 4 years. There have been no exceedances for 4 years	An area encompassing Bridge Street, from its junction with Newmarket Street up to and including the area around the junction with Castle Parade and Porthycarne Street	http://www.monmouthshire.gov.uk/app/uploads/2013/08/Usk-Action-Plan-Final-September-2009.pdf
Hardwick Hill, Chepstow	NO$_2$ annual mean	There have been improvements in air quality in the AQMA over the last 4 years. One location continues to exceed.	An area encompassing properties either side of the A48, between the roundabout with the A466 to the west and extending east just beyond the junction with the B4293 at Hardwick Terrace	http://www.monmouthshire.gov.uk/app/uploads/2013/06/Chepstow-AQAP-Final-31-August-2011.pdf

AMQA boundary maps within Monmouthshire can be viewed at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=403 and are included in Appendix C.

1.3   Implementation of Action Plans

Monmouthshire County Council has taken forward a number of measures during 2018 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 1.2. More detail on these measures can be found in the Air Quality Action Plan relating to the relevant AQMA.

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 by way of regular steering group meetings.

Key completed measures are:

Implementation of a 20 mile an hour zone through the Usk Air Quality Management Area, enforcement of double yellow line parking, lorry watch scheme to help enforce the Road Traffic Order, as well as improved signage.

Completion of a WelTAG (Welsh Transport Appraisal Guidance) stage 1 assessment for air quality based improvements in Chepstow.

Monmouthshire County Council expects the following measures to be progressed over the course of the next reporting year:

Assessment of impacts of removing the Severn Bridge Tolls on the Chepstow AQMA.
Funding for Stage 2 of the Chepstow WelTAG study.

Scoping/feasibility of creating a shared space (for vehicles and pedestrians in the Usk AQMA.

Table 1.2 – Progress on Measures to Improve Air Quality

Chepstow – Action Plan Measures

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
1.	Chepstow integrated Transport Strategy	MCC	n/a	n/a	No progress	No progress	n/a	n/a
2.	Limit HGV weight or emissions	Welsh Government	n/a	n/a	No progress as A48 still a trunk road and considered not appropriate	Considered in 2013 public consultation. Considered again in 2018 WelTAG study. Not considered feasible	n/a	n/a
3.	Amend MOVA at Tesco (Upper Street) traffic lights	Welsh Government	n/a	n/a	Completed	Completed	April 2012	Anecdotal evidence suggests less congestion on Hardwick Hill
4.	Encourage car sharing	MCC	Ongoing	None	There are a number of informal car sharing locations people use. MCC is looking in =to ways to formalise them	Transition Chepstow have taken lead in identifying places for car sharing carparks, and using an app to advertise them.	Ongoing	Depending on the uptake – and provided the car sharing removes vehicles from the AQMA.

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
						One such location is Chepstow Race Course. MCC currently looking into finding a gate for the carpark so the Race Course will allow the use of its Car park for this purpose		
5.	Monitor developments in adjoining areas	MCC	Ongoing	Number of air quality assessment asked for	Good working relationship with planners. Also liaise with Forest of Dean regularly	Good working relationship with planners. Also liaise with Forest of Dean regularly	Ongoing	Could be potential emissions reductions in the long term (or at least reductions on increases).
6.	Improve Council integration on planning issues	MCC	Ongoing	Consultation between departments	Good working relationship with planners.	Good working relationship with planners.	Ongoing	Could be potential emissions reductions in the long term (or at least reductions on increases).
7.	Education of HGV operators	MCC	Ongoing	n/a	None specifically for Chepstow	None specifically for Chepstow	Ongoing	Could be potential emissions reductions with eco driving techniques.
8.	Improve cross boundary working	MCC	Ongoing	n/a	MCC Env Health sits on Forest of Dean AQ Steering Committee	Good integration with Forest of Dean	Ongoing	Could be potential emissions reductions in the long term (or at least reductions on increases).
9.	Include LDP Policy covering air quality	MCC	Complete	n/a	Policy in the LDP.	New LDP currently in progress and Air	Ongoing	In the long term could be significant if affects major developments.

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
						Quality will be a factor.		However, there is a lot of pressure on MCC to increase housing especially in the south of the County. There are contradictory pressures from Government of increasing housing and reducing vehicle emissions
10.	Redesign High Beech Roundabout	Welsh Government in partnership with MCC	n/a	Completion of roundabout improvements	Discussions in relation to new development. Contributions being secured through planning process. This will be implemented as a phased program of works including Station Road junction improvement and Bulwark junction improvement	Not currently being progressed by Welsh Government due to costs. Considered again in 2018 WelTAG study but not recommended for progress	Several years after Station Road improvements to allow monitoring and improvements in car engines. Currently unlikely to be undertaken.	Localised improvements round the Roundabout. Potential improvements on the A48 assuming reduced queuing times.
11.	Target schools Traffic	MCC in partnership	Ongoing	Number of Travel Plans in place	None specifically in Chepstow	Env Health installed air quality sensor at Chepstow Comp in Summer 2018. Hopeful the data	Sensor installed. Monitoring in progress	Could potentially provide reductions in emissions at locations close to schools, or at congestion hotspots.

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
						will be used by the school as well to educate pupils, and have an impact on parent's school runs	Work with school over next 12 months to try to include the data in education	
12.	Promote Sustainable transport as part of new developments	MCC	Ongoing	n/a	General improvements as part of planning process	General improvements as part of planning process	Ongoing	Could be potential emissions reductions in the long term (or at least reductions on increases).
13.	Promote town centre developments	MCC	n/a	n/a	1 town centre development with planning permission, and 1 in the LDP	1 town centre development with planning permission still under construction, and 1 in the LDP	n/a	n/a
14.	Rail Park and Ride	MCC	n/a	n/a	On-going – Funding applied for & P&R from racecourse complete. Improvements made to the carpark to enable additional parking and room for buses	Race course require a gate/barrier before allowing it to be used. MCC looking into finding. Considered in 2018 WelTAG Stage 1 and recommended for further consideration at stage 2	n/a	Park and Ride on race course likely to cause some emissions reductions on Hardwick Hill.

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
15.	Support the climate change and sustainable energy strategy	MCC	n/a	n/a	General support, particularly for transport measures	No specific progress	Ongoing	Unlikely to be significant.
16.	Travel Plans	MCC	Ongoing	Numbers of Travel Plans in place	No specific progress in Chepstow other than Active Travel work	n/a	Ongoing	Unlikely to be significant unless resources put into Travel Planning.
17.	Bypass	Welsh Government	n/a	n/a	Not being progressed at present however considered in 2018 WelTAG stage 1 assessment, and recommended for further appraisal at Stage 2	Four potential route were considered in the 2018 WelTAG Stage 1 study. One route was recommended for further consideration at Stage 2.	Unknown at present	Likely to take a substantial amount of traffic off the A48 through Chepstow
18.	Improve bus services	MCC	Ongoing	Bus patronage	C5 service used to serve Chepstow Rail Station has been re-timed, enabling greater integration with Gloucester and Newport bound rail services.	Improved public transport integration was considered in 2018 WelTAG stage 1 assessment and recommended for further consideration at stage 2	Ongoing	Some improvements if modal shift from car to bus and train.
19.	Improve public transport integration	MCC	Ongoing	Bus and train patronage	As above	As above	Ongoing	Some emissions improvements if modal

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
								shift from car to bus and train
20.	Origin and Destination survey	MCC	2011	Survey undertaken	Complete	Completed in 2011	Completed	Identified a significant number of HGV's were using A48 as a through route to avoid paying the Severn Bridge Toll
21.	Provide information for residents	MCC	Ongoing	n/a	Information provided on MCC website, and at meetings	MCC website updated. Steering group meetings	Ongoing	n/a
22.	Target HGVs using unsuitable satnav routes	MCC	Not progressed	n/a	Included in 2013 public consultation however Welsh Government considered it in Detail Design stage in 2015/16 and will not progress at this time	No specific progress	n/a	n/a
23.	Improve rail services to the town	Network Rail/ MCC	Ongoing	Numbers of train passengers	From May 24 2011, 14 more Cross Country trains a day will stop at Chepstow to gauge customer demand for a more frequent service.	Improved public transport integration was considered in 2018 WelTAG stage 1 assessment and recommended for further consideration at stage 2	Ongoing	Potential emissions reductions if modal shift from car to train

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
24.	Upgrade the railway station	Network Rail/ MCC	Not progressed	n/a	Improved parking and bus drop of space	None	n/a	n/a
25.	Improve cycling facilities	MCC	On-going	Uptake of cycle routes	Walking/cycle routes identified in Active Travel plan	A number of routes identified for improvement. A-B connecting Communities actively working on improving the Wye Wander Route	n/a	Greater uptake of cycle routes should help reduce local traffic in and around Chepstow
26.	Bus Park and Ride/ Share	MCC	On-going	Numbers of people using P&R	P&R set up from Chepstow Race Course	Considered in 2018 WelTAG Stage 1 and recommended for further consideration at stage 2	n/a	Park and Ride on race course likely to cause some emissions reductions on Hardwick Hill
27.	Distribution hub	MCC	Not progressed	n/a	Considered unsuitable for Chepstow	Not progressed	n/a	n/a
28.	Lobby for change in toll system at Severn Bridge	MCC/ Welsh Government	On-going	n/a	Toll removal occurred in 2019	WG to undertake a before and after traffic study to determine how the toll removal has impacted	December 2018 With traffic study undertaken in 2018 (before) and same time of year in 2019 (after	The Origin and Destination study identified a significant number of HGV's using Hardwick Hill to avoid Tolls, hence Toll removal was included in the Action Plan. However, it now appears that Toll removal will remove a barrier for car use, and

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
								could increase traffic. Chepstow is being marketed as a cheaper housing market for Bristol Commuters.
29.	Promote Rail Freight	MCC/ Network Rail	Not progressed	n/a	No specific progress in Chepstow	No specific progress in Chepstow	n/a	n/a

Usk Action Plan Measures

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
6.	Management of on and off-street parking consideration of delivery time strategy	MCC	complete	n/a	Police in Usk have increased enforcement of on street parking. M.C.C improved car park signage Chamber of Commerce re-established and members of Steering Group. Chamber of Commerce	M.C.C. have taken over enforcement of double yellow line parking, in bid to increase enforcement.	Complete, however ongoing work required to continually engage with police and chamber of commerce	Reducing on street parking has improved congestion at peak times.

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
					actively engaging with businesses (letters and emails and meetings) to promote non-roadside deliveries and/or off-peak deliveries			
5.	HGV Restriction along Bridge Street – to be informed by surveys and subsequent report	MCC	On going	HGV numbers	There is a RTO in place, but difficult for police to enforce due to its length and proximity to the Caerleon RTO. As such enforcement is minimum and two Caerleon businesses have been allowed to breach the RTO without penalty. In addition, there are local businesses who use HGV's that are exempt. As such the RTO has not been successful in the past.

MCC has spent a great deal of time working with the police and local businesses and town council to replace the RTO with a more effective one. First a shortened RTO was proposed, but opposed by local businesses, secondly a time ban (e.g. no | Current RTO: -

Signage in place

Lorry Watch - ongoing | Emissions reductions if HGVs are taken off the route through Usk. Likely to be the most beneficial measure in terms of reducing emissions and concentrations. |

Action Plan Measure No.	Measure	Lead authority	Implement ation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
					HGV's at all in peak traffic times) but was again opposed. It has now been decided to no longer pursue the implementation of new RTO's however the current one is still in place. Work has been undertaken, however, to try to make the exiting RTO more effective - Signage improved (sat nav signs and CCTV signs), and a Lorry Watch Scheme was implemented and run by a consultancy, but has now been taken over by Trading Standards. HGV's in breach of the RTO are recorded by local volunteers to TS, who send warning letters, and if necessary fines to the company.			
3.	Encourage walking as a mode of transport	MCC	On going	n/a	MCC undertaken Active Travel Act duties including identification of walking routes in Usk and improvements to routes.	On going	Unlikely to be significant emissions reductions.
8.	Increase the number of public transport services to and from Usk.	MCC	Ongoing	Numbers of public transport services	Bus companies report loss of money from routes and require additional MCC funding. Currently MCC priority is to	Ongoing	Unlikely to be significant emissions reductions.

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
	include community transport				return bus services to previous levels			
9.	Contain indirect emissions from future development and from changes of land use that would generate traffic	MCC	Ongoing	Numbers of air quality assessments requested	No relevant development in Usk	n/a	Ongoing	Could be significant in the future.
15	Travel Awareness Campaigns	MCC	Ongoing but not specifically targeting Usk at the moment	n/a	None in Usk	n/a	Ongoing	Sustained travel awareness campaigns coupled with improvements to alternatives could reduce car use and therefore reduce emissions.
New	Work with school and others to produce a community and school traffic plan	MCC in partnership	Ongoing	Numbers of Travel Plans in place	A member of the Steering Group is a Governor at Usk School and is proactively engaging with the School to encourage improve parking arrangements and to encourage walking on behalf of the Group.	Air Quality monitoring undertaken at School, coupled with potential education opportunities using the monitoring data. Educating the children should help inform parents of emissions from school drop-offs and	On-going – Continuous monitoring installed at school in summer 2018, and school taking part in Eco School diffusion tube monitoring education package. Monitoring data from the sensor will be available to the school for	Could potentially provide reductions in emissions at locations close to schools, or at congestion hotspots.

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
						encourage alternative.	teaching purposes via a website	
1.	Encourage more cycling: implement hierarchy of urban and inter-urban cycle routes	MCC	On-going	Numbers of cyclists	MCC working on Active Travel Act that will include Usk cycle and walking routes	MCC working through the stages of the Active Travel Act	On-going	Potential reductions in emissions if modal shift from car to cycling.
2.	Support and promote facilities for cyclists at school and in town centres	MCC	On-going	Numbers of cyclists	Provision of cycle racks on Bridge Street	Part of Active Travel Act work	On-going	Potential reductions in emissions if modal shift from car to cycling.
13.	Car club scheme	MCC	n/a	n/a	n/a	Not being progressed – unlikely to be effective	n/a	n/a
New	Develop kerbside recycling collections to reduce traffic to civic amenity site	MCC	Complete	n/a	Complete	n/a	n/a	Unlikely to have a major impact on emissions. Included in original Action Plan to reduce number of household trips to Municipal Refuse Site.
14.	Flexible home working, work times etc.	MCC	Ongoing	Number of work-related trips in private single occupancy cars.	Promoted within MCC.	Much greater levels of homeworking within MCC	Ongoing	Unlikely to have a major impact on emissions. Anecdotally MCC staff seem to be travelling further since new scheme brought in.
7.	Implement new 20mph speed limits/ zones	MCC	Complete	n/a	This has now been put in place by MCC in 2018	A Share Space Concept is being considered by	Completed	Too soon to report on. Reduction of speed alone is unlikely to have an impact, as traffic studies have shown

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
					Modelling undertaken for 20mph – however it showed increased emissions, as it created additional queuing. Therefore, implemented without road obstacles that could increase congestion.	MCC and a consultant. Currently awaiting results of a community survey.	On-going – early stages of viability work	that vehicles in Usk do not tend to exceed 20mph in the day. However, it is possible that less accelerating and braking up to and down from 30mph might reduce emissions, and a 20mph zone might discourage certain vehicles, who could take a faster road.\n\n2018 was the first full year of 20mph, and emissions in Usk were recorded at an all time low (however this occurred Countywide)\n\nIn addition, it is possible that this will be the first step in making Usk town centre a more pedestrian orientated place, rather than a vehicle through route. Options are being looked into to create a Shared Space.
New	Investigation of altering traffic flows through the town	MCC		n/a	Considered again in 2014 and modelled for a number of options. Each option, however, increased congestion and emissions.		Will not be progressed	Increased emissions

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

2.1 Summary of Monitoring Undertaken in 2017

2.1.1 Automatic Monitoring Sites

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

Monmouthshire County Council undertook automatic (continuous) monitoring at one location in 2018, using three analysers.

Table 2.1 presents details of the analysers, with the location shown in Figure 2.1. The automatic analysers are located in Chepstow at the Air Quality Monitoring Station (AQMS) located on the A48 on the pavement of Hardwick Hill, which is within the Chepstow Air Quality Management Area and at a roadside location. The AQMS is situated in a location that is the closest it can technically be (based on its size and available space and power) to the location of the highest recorded concentrations in the county.

National monitoring results are available on the Welsh Air Quality Forum (WAQF) and DEFRA websites http://www.welshairquality.co.uk   http://uk-air.defra.gov.uk/

The automatic monitors became part of the UK's Automatic Urban and Rural Network (AURN) in January 2008. In February 2010 the PM_{10} monitor was upgraded to a TEOM-FDMS (Filter Dynamics Measurement System) analyser and a TEOM-FDMS $PM_{2.5}$ analyser was introduced. TEOM-FDMS monitors are accepted as giving results equivalent to the European Gravimetric Standard Method. The analysers in use at the station are Thermo Scientific rp Series. There are two 8500 FDMS units, two 1400A TEOM Sensor Units and two 1400A TEOM Control Units.

In 2018 the AURN began replacing the TEOM-FDMS analysers in the network with BAM (Beta Attenuation Monitors) analysers. The analysers in the Chepstow AQMS were replaced in August 2018, Therefore PM_{10} and $PM_{2.5}$ data reported for January to July 2018 is TEOM-FDMS data and August to December 2018 is BAM data.

The previous nitrogen dioxide analyser (Monitor Labs 9841B chemiluminescence analyser) and Odessa data logger were replaced in January 2012 under the Affiliate Upgrade Compliance Programme to the latest compliant Monitor Europe 20xx series continuous gaseous analyser (ML 2041 NOx Chemiluminescence Analyser).

In 2018, Air Monitors serviced the NOx analyser and Enviro Technology serviced the PM10 and PM2.5 analysers, and all three were audited by Ricardo-AEA. Services and audits are undertaken twice a year. Monmouthshire County Council undertakes routine LSO (Local Site Operator) duties at the station including regular calibration checks, filter changes, BAM tape changes and calibration gas changes.

Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

2.1.2 Non-Automatic Monitoring Sites

Monmouthshire County Council undertook non- automatic (passive) monitoring of nitrogen dioxide at 42 locations using nitrogen dioxide diffusion tubes. The tubes were installed as close as possible to relevant and sensitive receptors such as schools and houses along the county's busiest road networks. Where it was not possible to install a tube at a relevant receptor (due to lack of permission, or lack of an unobstructed fixing position) the tubes were installed at the nearest lamppost to the receptor. In these situations, a distance correction calculation was used to determine the concentrations at the receptor based on the concentrations recorded by the nearest diffusion tube.

In addition to the 42 diffusion tubes used for monitoring relevant receptor locations, 3 tubes were used in a co-location study next to the nitrogen dioxide inlet of the Chepstow AQMS to obtain data for the local and national Bias Adjustment Factor study, and a further tube was used as a travel blank.

Since May 2010, Monmouthshire County Council has used diffusion tubes prepared and analysed by Gradko International Limited using 20% TEA in Water. The tubes are changed every month (either 28 or 35 days) and sent to Gradko for analysis.

Further details on Quality Assurance/Quality Control (QA/QC), bias adjustment and distance correction for the diffusion tubes are included in Appendix C.

Table 2.2 presents the details of the monitoring locations and maps showing their locations are provided in Figure 2.1

Table 2.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	In AQMA	OS Grid Reference		Pollutants Monitored	Monitoring Technique	Inlet Height (m)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
				X	Y					
AQMS	A48 Hardwick Hill, Chepstow	Roadside	Chepstow A48/Hardwick Hill AQMA	353125	193472	PM_{10} $PM_{2.5}$	TEOM FDMS (Jan-July) BAM (Aug-Dec)	2.5	7.5m	3
						NO_x NO_2	Chemiluminescence			

Map of Automatic Monitoring Site

The Chepstow AQMS location and current data can be viewed at - https://airquality.gov.wales/. A map is also provided in this report, along with the diffusion tube monitoring locations on Hardwick Hill, in Figure 2.1

Table 2.2 – Details of Non-Automatic Monitoring Sites

| Site Name | ID | Site Type | OS Grid Ref | | Site Height (m) | In AQMA | Relevant Exposure | Distance to receptor (m) | Distance to kerb of nearest road (m) | Worst-case exposure | Date of Installation/ removal |
			X	Y							
38 Larkfield Park, Chepstow	CH1	Roadside	352800	193274	1.6	Yes	Yes	0.15	10	Yes	30/09/2003
Newport Road Lamppost No. WH70, Nr Larkfield House, Newport Road (A48) Chepstow	CH2a	Roadside	352821	193307	2.45	Yes	No	5.6	1.75	Yes	08/01/2014
36 Wayside, Hardwick Hill (A48) Chepstow	CH3	Roadside	352970	193452	1.7	Yes	Yes	0.18	12	Yes	30/09/2003
2 Hardwick Hill (A48) Chepstow.	CH4	Roadside	353009	193444	3.1	Yes	Yes	0.59	4	Yes	31/05/2005
1 Ashfield House, Mount Pleasant (A48) Chepstow	CH5	Roadside	353141	193451	1.6	Yes	Yes	0.23	14	Yes	30/01/2006
Rainwater Pipe, Hill House, Hardwick Hill (A48) Chepstow.	CH6	Roadside	353166	193586	2.3	Yes	Yes	0.18	6	Yes	30/09/2003
Rainwater Pipe 2 Hardwick Terrace, Chepstow	CH7	Roadside	353164	193663	2.57	Yes	Yes	0.16	1.5	Yes	29/08/2006
Lamp post, Moor Street, Chepstow	CH8	Kerbside/ Urban Centre	353219	193730	2.75	No	Yes	0.5	1.65	Yes	04/07/2007

Site Name	ID	Site Type	OS Grid Ref		Site Height (m)	In AQMA	Relevant Exposure	Distance to receptor (m)	Distance to kerb of nearest road (m)	Worst-case exposure	Date of Installation/ removal
			X	Y							
Restway Wall, Garden City Way, (A48) Chepstow	CH9	Roadside	353306	193681	1.91	No	Yes	0.18	11	Yes	30/09/2003
AQMS Hardwick Hill (A48) Chepstow – Collocated with a continuous Analyser	AQ1 AQ2 AQ3	Roadside	353125	193472	2.9	Yes	Yes	7.5	4	Yes	02/01/2004
Lamppost NY237 - 1 The Chestnuts, Pwllmeyric	PWLL1	Roadside	351983	192594	2.35	No	No	16	1.22	Yes	03/10/2018
Lamppost NY241 - The Cedars, Pwllmeyric	PWLL2	Roadside	351873	192489	2.35	No	Yes	1.9	1.9	Yes	03/10/2018
Lamppost NY246 - Hill House, Pwllmeyric	PWLL3	Roadside	351724	192370	2.35	No	No	6.2	1.4	Yes	03/10/2018
2 White Cottage, Pwllmeyric	PWLL4	Roadside	351666	192300	2.35	No	Yes	0.1	2.2	Yes	03/10/2018
School House, Wyebridge Street, Monmouth – new position	MM1	Roadside	351072	212821	2.7	No	Yes	0.18	3.4	Yes	30/10/2013
Flat 1, Granville Street, Monmouth – new position	MM2	Intermediate	351139	212894	2	No	Yes	0.24	25	Yes	30/10/2013
Lamp post adjacent 21 St. James Square, Monmouth	MM3	Kerbside	351085	212930	2.3	No	Yes	2.4	0.5	Yes	01/05/2004

Site Name	ID	Site Type	OS Grid Ref		Site Height (m)	In AQMA	Relevant Exposure	Distance to receptor (m)	Distance to kerb of nearest road (m)	Worst-case exposure	Date of Installation/ removal
			X	Y							
12a Monnow St. on St. John St. Monmouth	MM4	Kerbside/ Urban Centre	350718	212794	2.8	No	Yes	0.13	1.3	Yes	04/07/2007 Moved 5meters south 02/04/2014
Arka, Old Dixton Road, Monmouth	MM7	Intermediate	351197	212980	2.3	No	Yes	0.14	23	Yes	30/10/2013
1, The Shrubbery, Old Dixton Road, Monmouth	MM9	Intermediate	351467	213280	2.3	No	Yes	0.24	16	Yes	30/10/2013
Fence of Boys School Playground	MM11	Roadside	351024	212652	3	No	Yes	0.5	4.8	Yes	30/10/2013
Pike House, New Dixton Road, Monmouth	MM13	Roadside	351884	21361	1.63	No	Yes	0.19	6.53	Yes	04/12/2013
6 Monnow Street (Fancy Freds), Monmouth	MM15	Roadside / Urban Centre	350729	212811	2.3	No	Yes	0.15	1.5	Yes	02/04/2014
Lampost ME380 Adj 20A Monnow Street, Monmouth	MM16	Roadside / Urban Centre	350695	212775	2.3	No	Ye	1.35	2.1	Yes	02/04/2014
4 Agincourt Square - The Punch House, Monmouth	MM17	Roadside / Urban Centre	350779	212868	2.45	No	Yes	0.54	1.7	Yes	02/04/2014
Design & Technology Block Monmouth School, Monmouth	MM18	Roadside	351091	212791	2.1	No	Ye	0.18	13	Yes	29/10/2014

Site Name	ID	Site Type	OS Grid Ref		Site Height (m)	In AQMA	Relevant Exposure	Distance to receptor (m)	Distance to kerb of nearest road (m)	Worst-case exposure	Date of Installation/ removal
			X	Y							
Lamp post, 7 Ty Mawr, Monk Street, Monmouth	MM19	Roadside	350953	213098	2.45	No	Yes	1.5	1.75	Yes	04/02/2015
Lamp post ME399, 14 Victoria Place, Priory Street, Monmouth	MM21	Roadside	350910	213071	2.45	No	Yes	0.3	1.45	Yes	04/02/2015
Lamp post Merthyr Rd. (A4143), Abergavenny	AB1	Kerbside	329170	213867	2.4	No	Yes	0.35	0.85	Yes	04/07/2007
Back Clinic, 2a Bridge Cottages, Llanfoist, Merthyr Road, Abergavenny, NP7 9LL	AB2	Roadside	329202	213822	2.5	No	Yes	0.23	1.7	Yes	30/05/2012
112 Merthyr Road, Abergavenny, NP7 5DF	AB3	Roadside	329324	214080	2.5	No	Yes	0.25	1.8	Yes	30/05/2012
L/P Adj. 5 Coopers Way, Merthyr Rd, Abergavenny	AB4	Roadside	329275	213686	2.4	No	Yes	2.4	1.55	Yes	02/01/2013
1 Usk View, Merthyr Rd, Abergavenny	AB5	Roadside	329212	214075	1.9	No	Yes	0.13	5	Yes	02/01/2013
L/P No. MB991 Adj. 9 & 11 Merthyr Rd, Abergavenny	AB6	Roadside	329524	214470	2.3	No	Yes	0.5	1.3	Yes	02/01/2013
14A Castle Parade, Usk	USK1	Roadside	337860	201039	2.3	No	Yes	0.16	1.6	Yes	04/07/2007

Site Name	ID	Site Type	OS Grid Ref		Site Height (m)	In AQMA	Relevant Exposure	Distance to receptor (m)	Distance to kerb of nearest road (m)	Worst-case exposure	Date of Installation/ removal
			X	Y							
Castle Court, Usk. Rainwater Pipe	USK2	Roadside / Urban Centre	337710	200936	2.45	Yes	Yes	0.16	1.35	Yes	02/08/2005
White Hart, 5 Bridge Street, Usk Rainwater Pipe	USK3	Roadside / Urban Centre	337663	200906	2.4	Yes	Yes	0.15	1.3	Yes	02/01/2004
35 Bridge Street, Usk	USK4	Roadside / Urban Centre	337596	200849	2.5	Yes	Yes	0.15	1.3	Yes	04/11/2003
Lamp Post adjacent to No.16 Bridge Street, Usk	USK5	Roadside / Urban Centre	337562	200824	2.4	Yes	Yes	0.54	1.2	Yes	04/02/2003
4 Usk Bridge Mews, Usk Rainwater Pipe	USK6	Roadside / Urban Centre	337473	200755	2.6	Yes	Yes	0.21	4.9	Yes	02/01/2004
13 Woodside, Usk, Rainwater pipe	WS1	Kerbside	337363	200707	2.5	No	Yes	0.15	1	Yes	03/01/2017
19 Woodside, Llanbadoc, Usk, Rainwater pipe	WS2	Roadside	337356	200736	1.8	No	Yes	0.23	2.6	Yes	03/01/2017
22 Woodside, Llanbadoc, Usk, Rainwater pipw	WS3	Roadside	337364	200749	2.5	No	Yes	0	1.5	Yes	03/01/2017

WS1, WS2, WS3 were new monitoring location installed in 2017, to monitor concentrations west of the USK AQMA on the junction of the Usk River Bridge, that regularly becomes congested.

PWLL1, PWLL2, PWLL3, PWLL4 were new monitoring locations installed in October 2018 to monitor the A48 outside of Chepstow.

No monitoring sites were removed in 2018 the last sites removed were 2017.

Sites removed in 2017

Site Name	ID	Site Type	OS Grid Ref	Site Height (m)	In AQMA	Relevant Exposure & distance to Receptor (m)	Distance to kerb of nearest road (m)	Worst-case exposure	Date of Installation/ removal
Millhouse, Granville Street, Monmouth	MM6	Intermediate	SO 511129	1.65	No	Yes 0.2	21	Yes	30/10/2013 – 03/01/2017
2 Riverside Park, Mayhill, Monmouth	MM14	Suburban	SO 51277 12822	1.77	No	Yes 0.15	98 – A465 113 – A40	No	06/03/2014 – 03/01/2017
Lampost ME514, 13 Monk Street, Monmouth	MM20	Kerbside	SO 50947 13122	2.45	No	Yes 1.75	1.05	Yes	04/02/2015 – 03/01/2017

- MM6 was removed, as monitoring over three years showed consistent reading below the objective level and lower than readings at locations either side (MM2 and MM7)

- MM14 was removed as monitoring overt three years showed consistent reading well below the objective level.

- MM20 was removed as monitoring over two years showed consistent readings below the objective level and lower than the two other diffusion tube locations in the immediate area (MM19 and MM21).

Figure 2.1 – Maps of Non-Automatic Monitoring Sites

Nitrogen Dioxide Monitoring Locations - Chepstow AQMA west (blue line is boundary of AQMA)
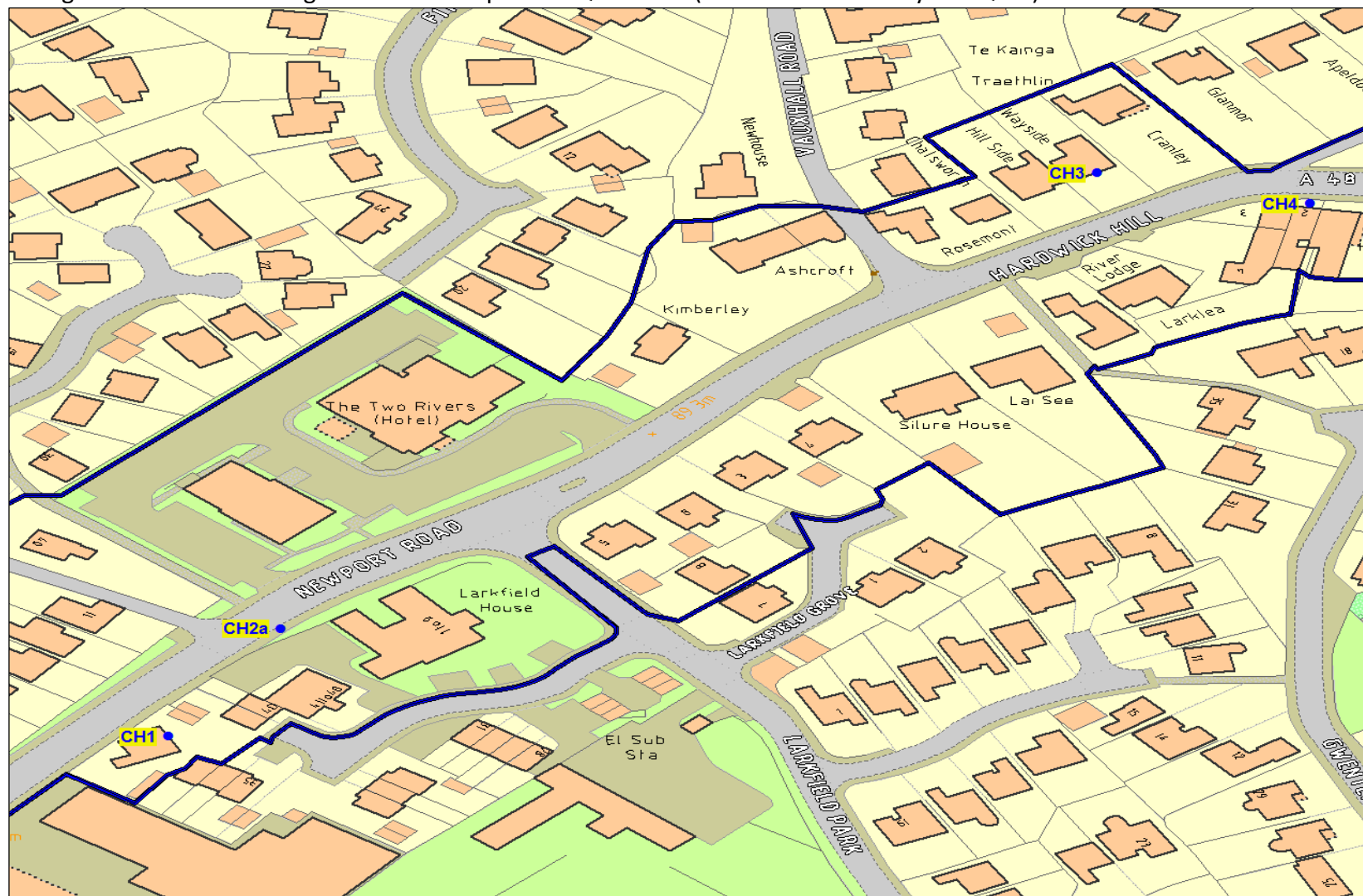
Nitrogen Dioxide & AQMS Monitoring Locations - Chepstow AQMA east (blue line is boundary of AQMA)

Nitrogen Dioxide Monitoring Locations – Pwllmeyric

Nitrogen Dioxide Monitoring Locations - Usk AQMA (blue line is boundary of AQMA)
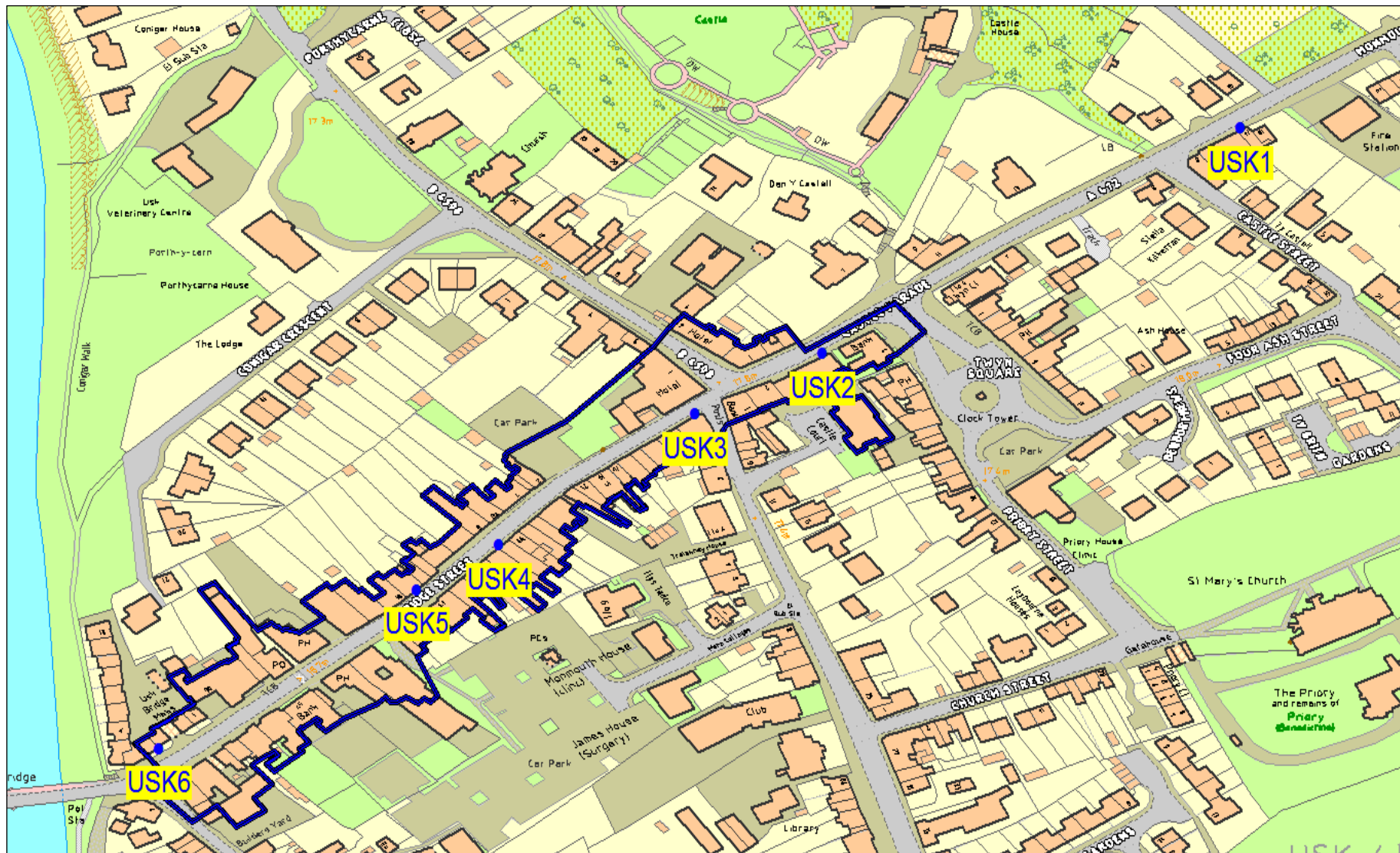
Nitrogen Dioxide Monitoring Locations – Woodside, Usk
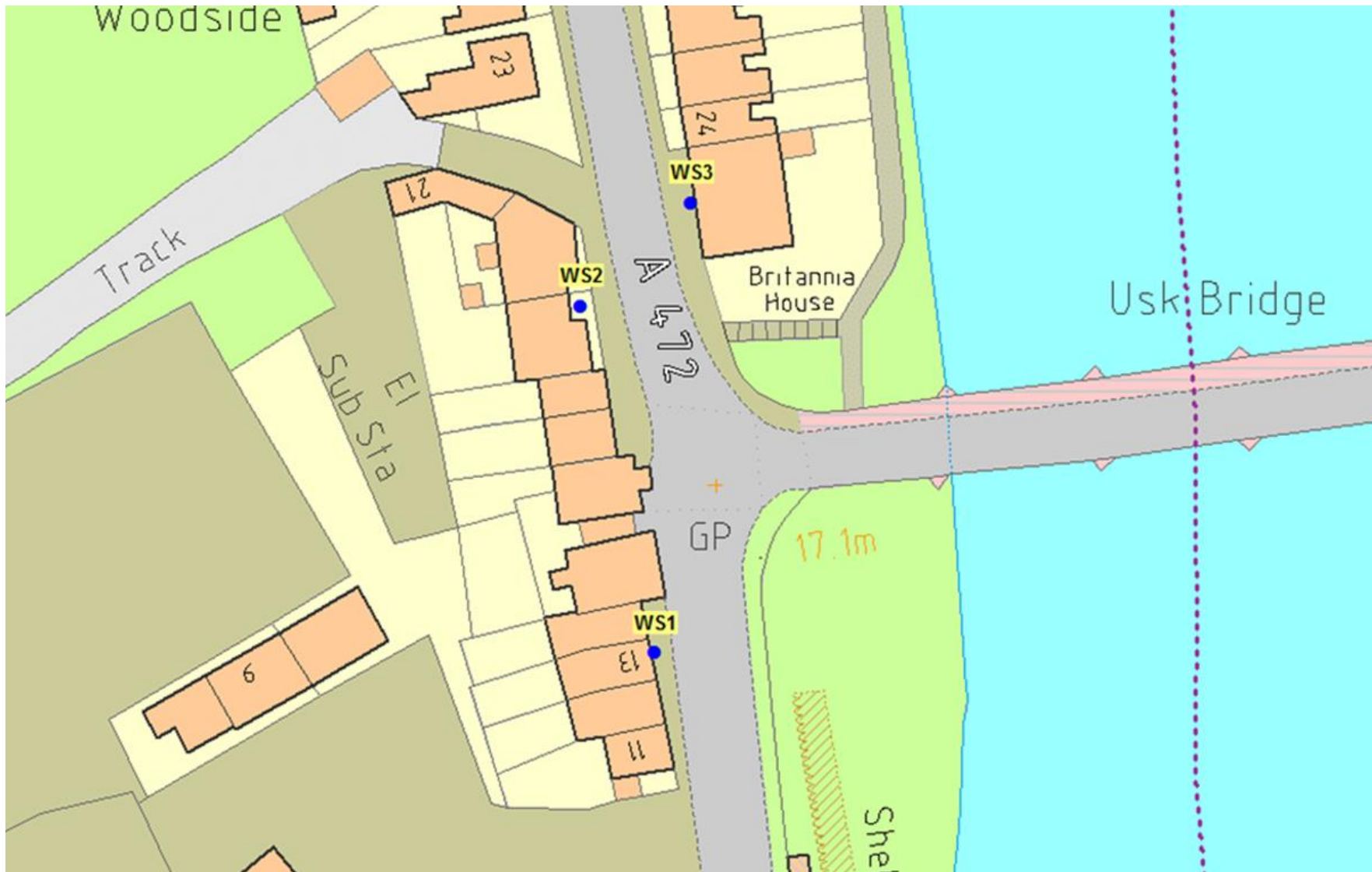
Nitrogen Dioxide Monitoring Locations – Monmouth, A40/Wyebridge Street & Riverside Park
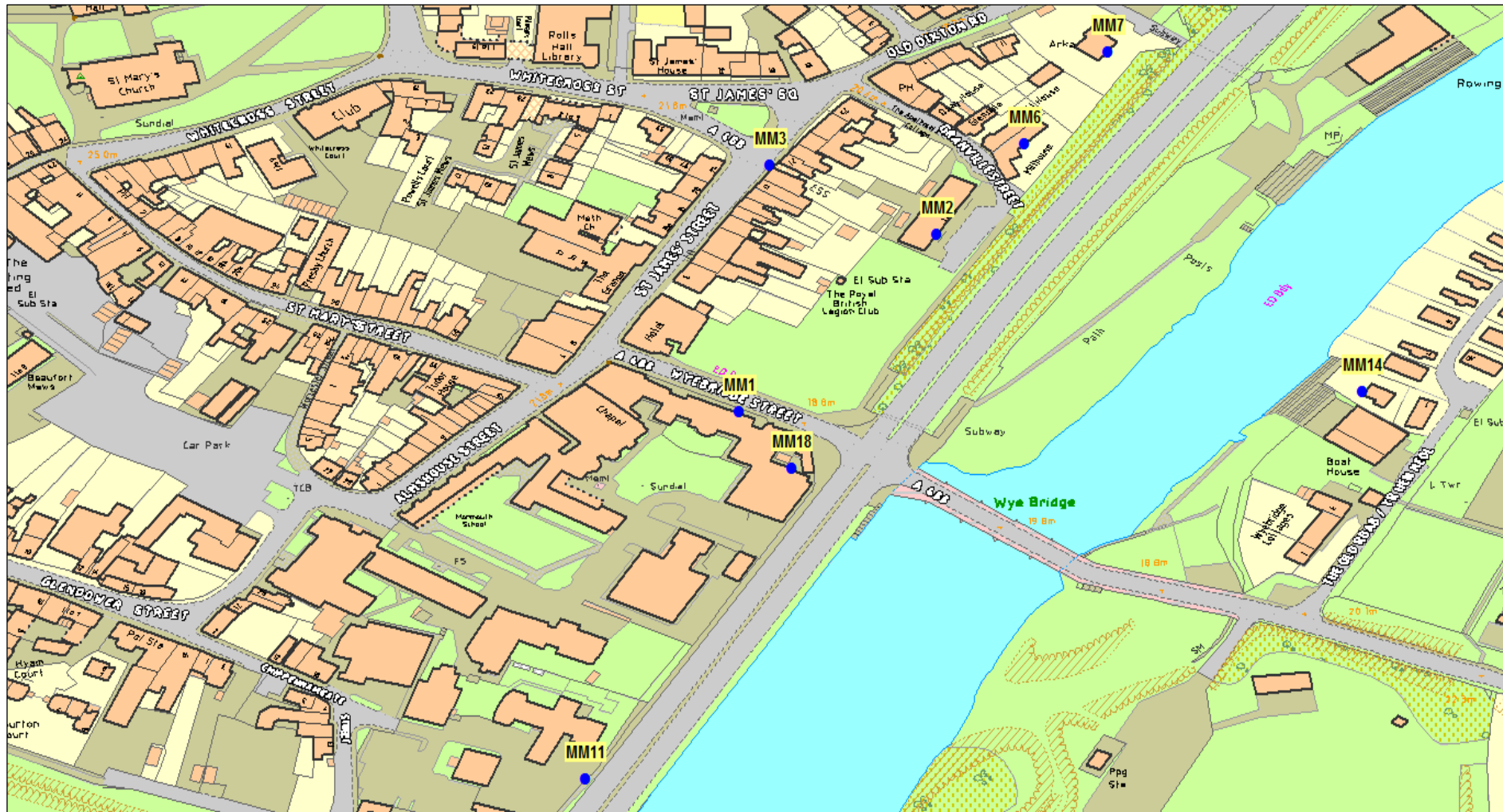
Nitrogen Dioxide Monitoring Locations – Monmouth, Monnow Street & Monk Street/Priory Street junction
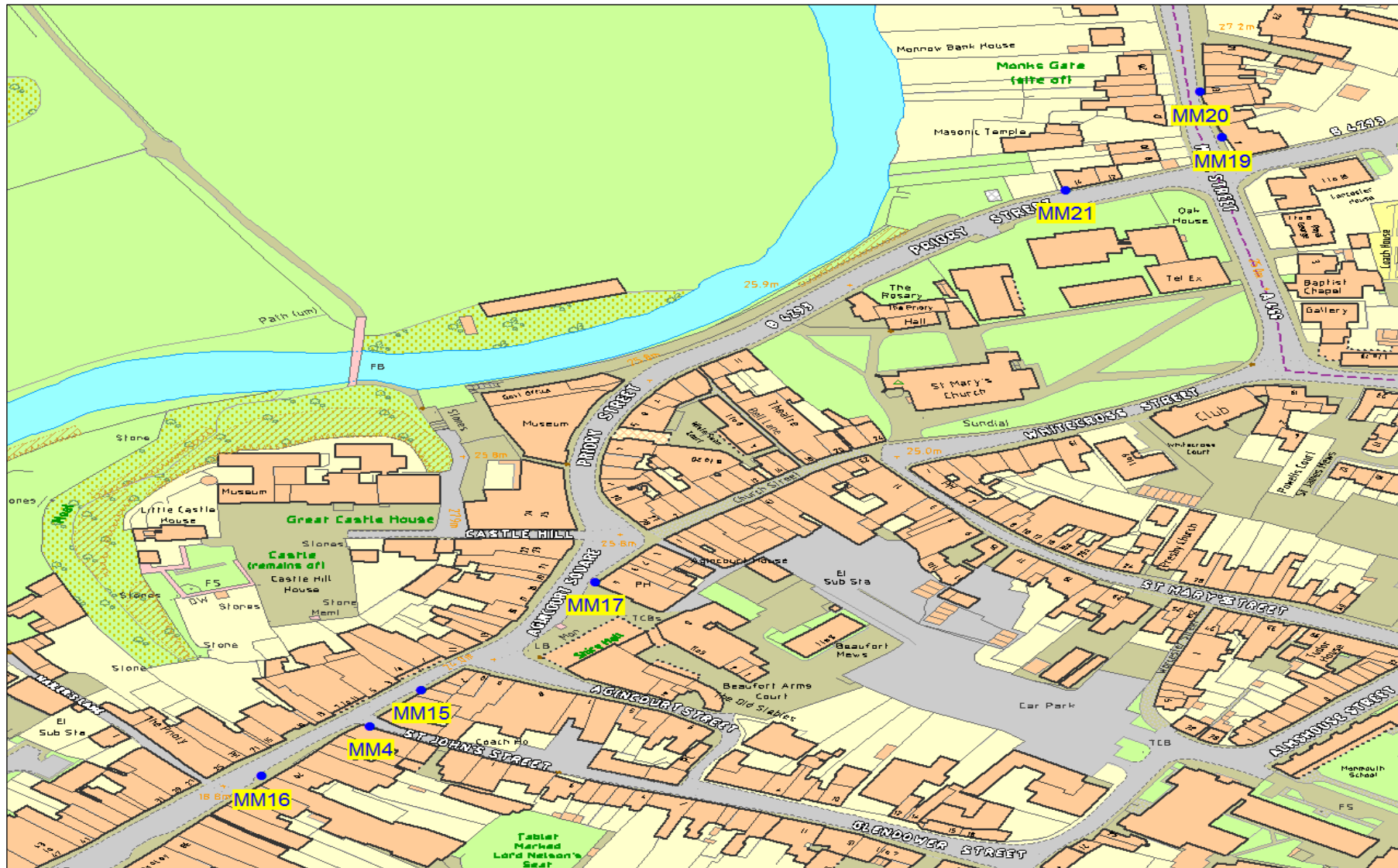
Nitrogen Dioxide Monitoring Locations – Monmouth, Old Dixton Road
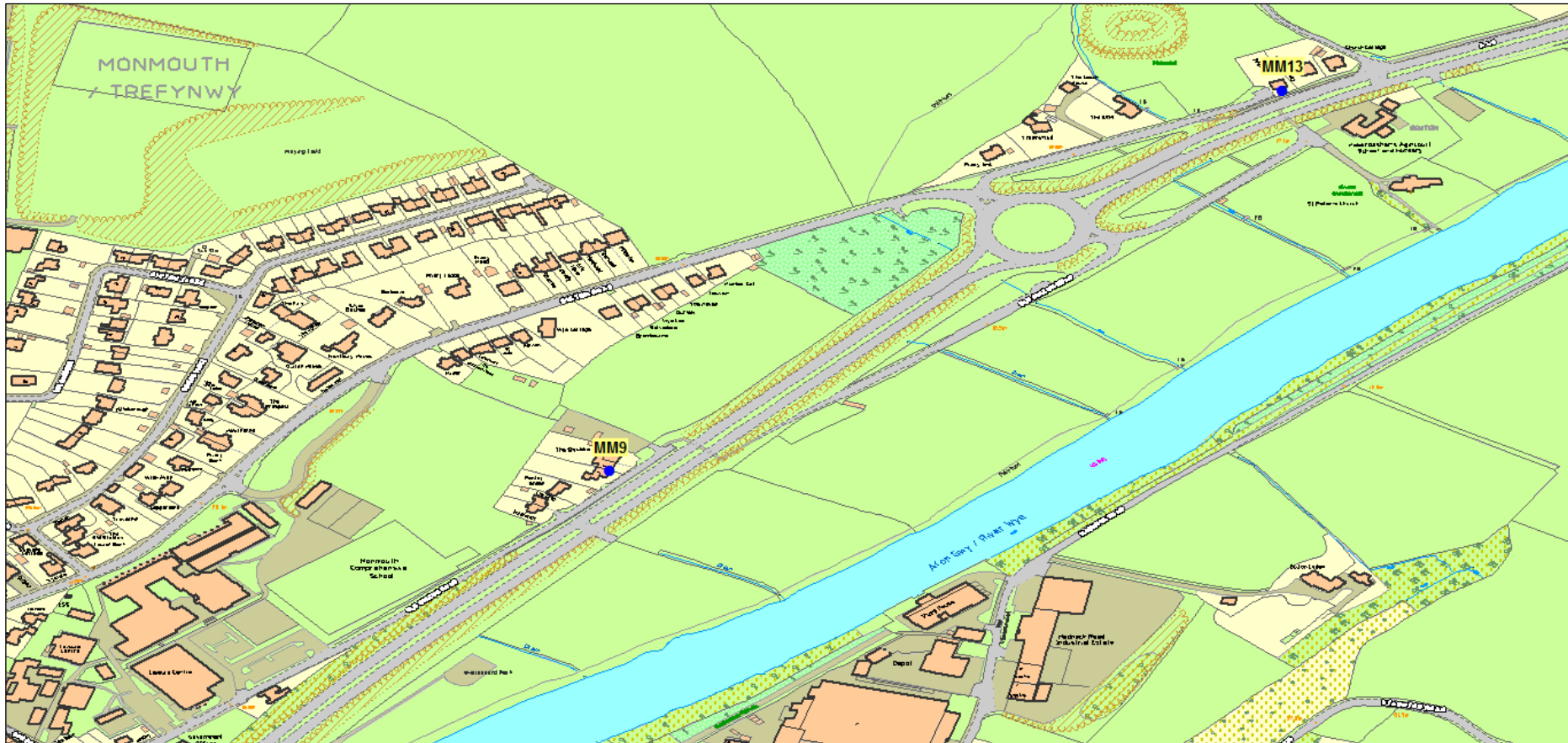
Nitrogen Dioxide Monitoring Locations – Abergavenny, South Merthyr Road
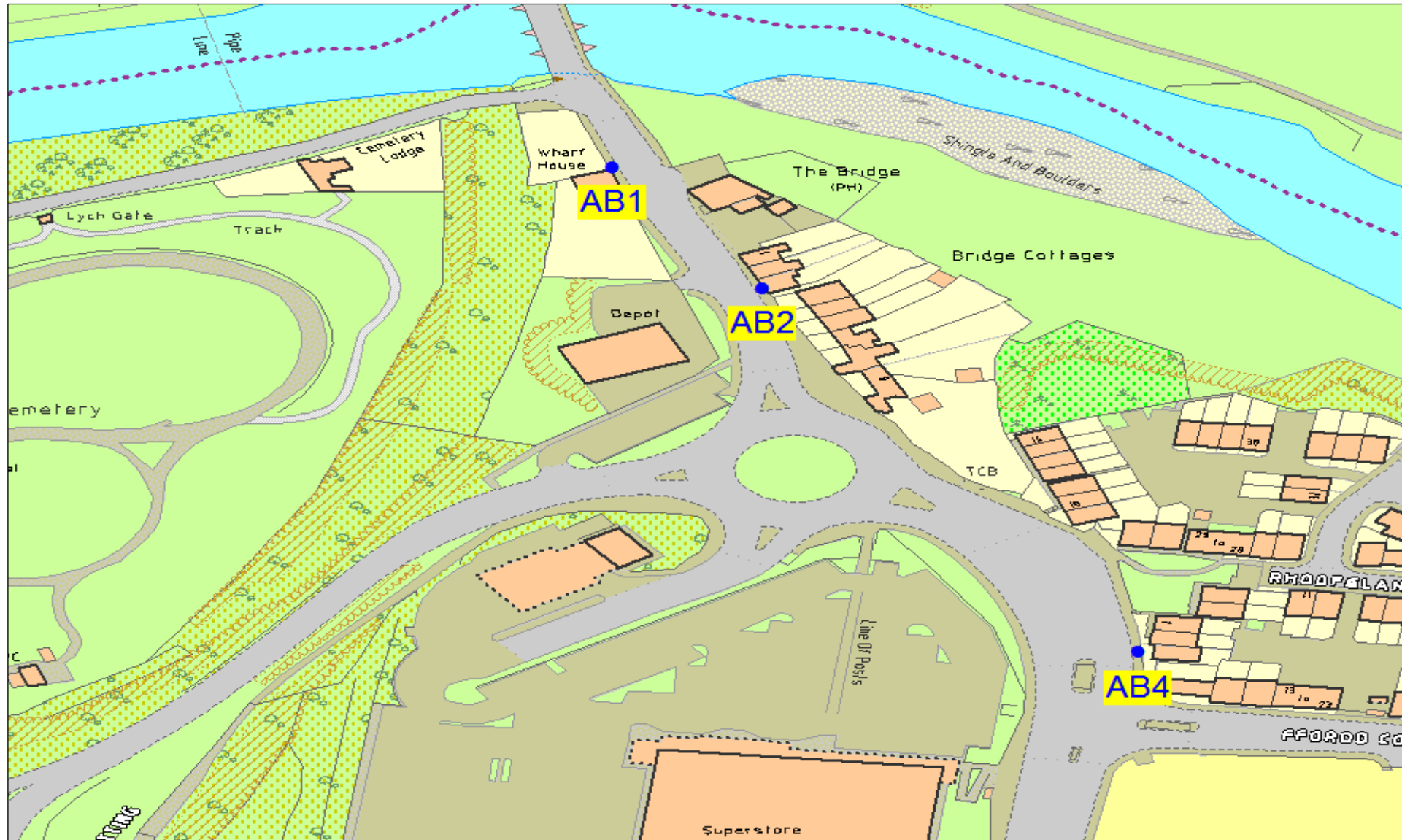
Nitrogen Dioxide Monitoring Locations – Abergavenny, North Merthyr Road
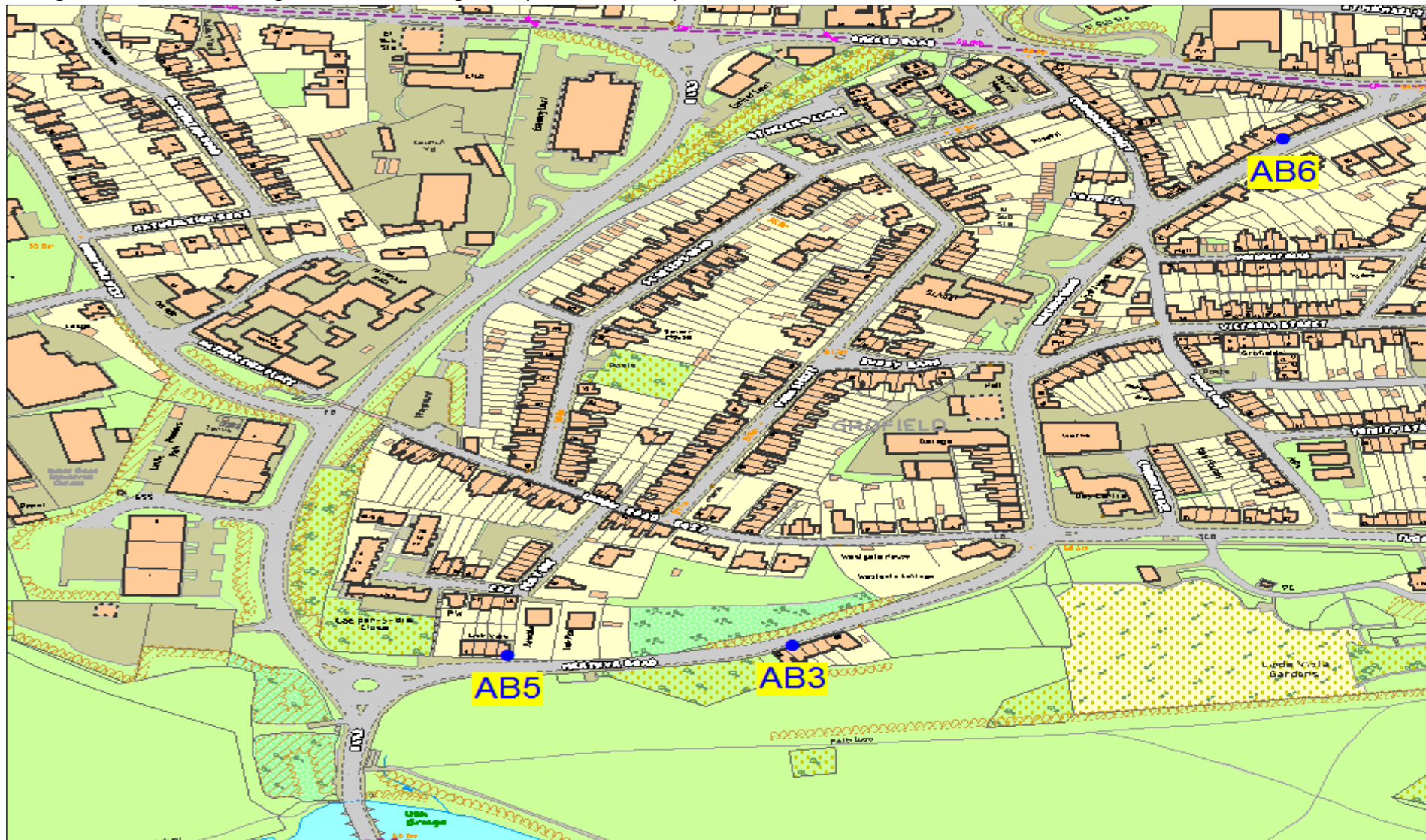
2.2   2018 Air Quality Monitoring Results

Table 2.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO₂ Annual Mean Concentration (µg/m³) [3]					
					2013	2014	2015	2016	2017	2018
Annual Bias Adjustment Factor (diffusion tubes only) [4]					0.95	0.91	0.91	0.92	0.87	0.92
AQMS	Roadside	Automatic Chemiluminescence	95	95	34.5	38.6	37	35	35	36
CH1	Roadside	Diffusion Tube	100	100	22.4	21.8	22.5	22.9	22.2	19.1
CH2a [5]	Roadside	Diffusion Tube	100	100	30.4	33.1	30.9	31.0	27.9	27.8
CH3	Roadside	Diffusion Tube	100	100	32.7	32.5	29.8	31.1	29.9	26.5
CH4	Roadside/	Diffusion Tube	100	100	**56.0**	**57.7**	**51.4**	**53.2**	**51.1**	**42.5**
CH5	Roadside	Diffusion Tube	100	100	28.4	26.1	25.9	26.7	26.8	23.5
CH6	Roadside	Diffusion Tube	100	100	**41.7**	**40.0**	36.8	37.6	37.1	34.3

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO$_2$ Annual Mean Concentration (µg/m^3) [3]					
					2013	2014	2015	2016	2017	2018
Annual Bias Adjustment Factor (diffusion tubes only) [4]					0.95	0.91	0.91	0.92	0.87	0.92
CH7	Roadside	Diffusion Tube	100	100	30.6	28.4	26.9	27.9	25.9	25.1
CH8	Kerbside/ Urban Centre	Diffusion Tube	83	83	31.1	31.8	28.1	27.7	27.1	26.4
CH9	Roadside	Diffusion Tube	100	100	28.1	27.8	25.5	27.2	26.8	23.6
MM1	Roadside	Diffusion Tube	100	100	34.1	34.9	32.8	33.1	33.9	31.6
MM2	Intermediate	Diffusion Tube	100	100	29.9	30.0	26.1	26.5	26.9	25.7
MM3	Kerbside	Diffusion Tube	100	100	26.3	26.3	22.9	23.4	23.9	22.5
MM4	Kerbside/ Urban Centre	Diffusion Tube	92	92	35.7	29.8	26.0	26.4	25.2	24.1
MM7	Intermediate	Diffusion Tube	100	100		27.4	24.3	25.3	23.8	22.9
MM9	Intermediate	Diffusion Tube	100	100		24.7	21.8	23.2	21.5	20.5

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO$_2$ Annual Mean Concentration (µg/m^3) [3]					
					2013	2014	2015	2016	2017	2018
Annual Bias Adjustment Factor (diffusion tubes only) [4]					0.95	0.91	0.91	0.92	0.87	0.92
MM11	Roadside	Diffusion Tube	100	100		31.6	26.4	30.2	27.0	29.0
MM13	Roadside	Diffusion Tube	100	100		34.7	32.5	32.1	35.1	32.5
MM15	Roadside/ Urban Centre	Diffusion Tube	100	100		35.2	33.1	33.7	32.3	31.8
MM16	Roadside/ Urban Centre	Diffusion Tube	92	92		32.9	30.0	30.6	27.9	26.6
MM17	Roadside/ Urban Centre	Diffusion Tube	100	100		24.7	22.6	24.5	22.7	21.6
MM18	Roadside	Diffusion Tube	100	100			26.7	28.1	28.7	25.9
MM19	Roadside	Diffusion Tube	100	100			29.3	31.2	28.2	30.0
MM21	Roadside	Diffusion Tube	92	92			32.1	34.6	32.6	32.2
AB1[5]	Kerbside	Diffusion Tube	100	100	37.5	39.3	36.1	38.4	38.0	36.9

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO$_2$ Annual Mean Concentration (µg/m^3) [3]					
					2013	2014	2015	2016	2017	2018
Annual Bias Adjustment Factor (diffusion tubes only) [4]					0.95	0.91	0.91	0.92	0.87	0.92
AB2	Roadside	Diffusion Tube	100	100	36.7	39.1	34.4	35.0	32.7	33.8
AB3	Roadside	Diffusion Tube	100	100	30.0	29.0	26.1	26.8	25.4	28.5
AB4	Roadside	Diffusion Tube	83	83	27.6	27.8	26.5	26.4	25.5	27.6
AB5	Roadside	Diffusion Tube	100	100	21.4	19.8	17.2	19.4	18.6	19.0
AB6	Roadside	Diffusion Tube	100	100	24.3	23.8	22.4	22.4	22.3	21.8
USK1	Roadside	Diffusion Tube	92	92	33.5	34.3	30.1	30.5	31.7	27.2
USK2	Roadside/ Urban Centre	Diffusion Tube	92	92	37.2	37.3	34.1	34.4	34.7	31.3
USK3	Roadside/ Urban Centre	Diffusion Tube	100	100	**40.3**	37.6	32.8	35.1	36.6	32.1
USK4	Roadside/ Urban Centre	Diffusion Tube	100	100	**42.0**	**40.4**	34.1	35.2	35.1	30.4

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO₂ Annual Mean Concentration (μg/m³) [3]					
					2013	2014	2015	2016	2017	2018
Annual Bias Adjustment Factor (diffusion tubes only) [4]					0.95	0.91	0.91	0.92	0.87	0.92
USK5	Roadside/ Urban Centre	Diffusion Tube	100	100	**43.1**	**40.9**	38.2	37.8	35.2	30.0
USK6	Roadside/ Urban Centre	Diffusion Tube	92	92	22.2	20.6	19.2	20.8	20.8	19.6
WS1	Kerbside	Diffusion Tube	100	100					25.8	23.8
WS2	Roadside	Diffusion Tube	100	100					29.6	27.1
WS3	Roadside	Diffusion Tube	100	100					21.3	22.6

Notes: Exceedances of the NO₂ annual mean objective of 40μg/m³ are shown in **bold**.

NO₂ annual means exceeding 60μg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined.**

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(4) As required by Technical Guidance, all diffusion tube annual means have been bias adjusted to the National bas adjustment factor. Further details can be found in appendix C. Un-bias adjusted monthly diffusion tube data is presented in Appendix A

(5) The monitoring locations not representative of public exposure, and therefore the results have been distance corrected as per https://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html

Figure 2.2 – Trends in Annual Mean NO₂ Concentrations

Automatic analyser – (AQMS) NO2 smoothed trend line 2007-2018
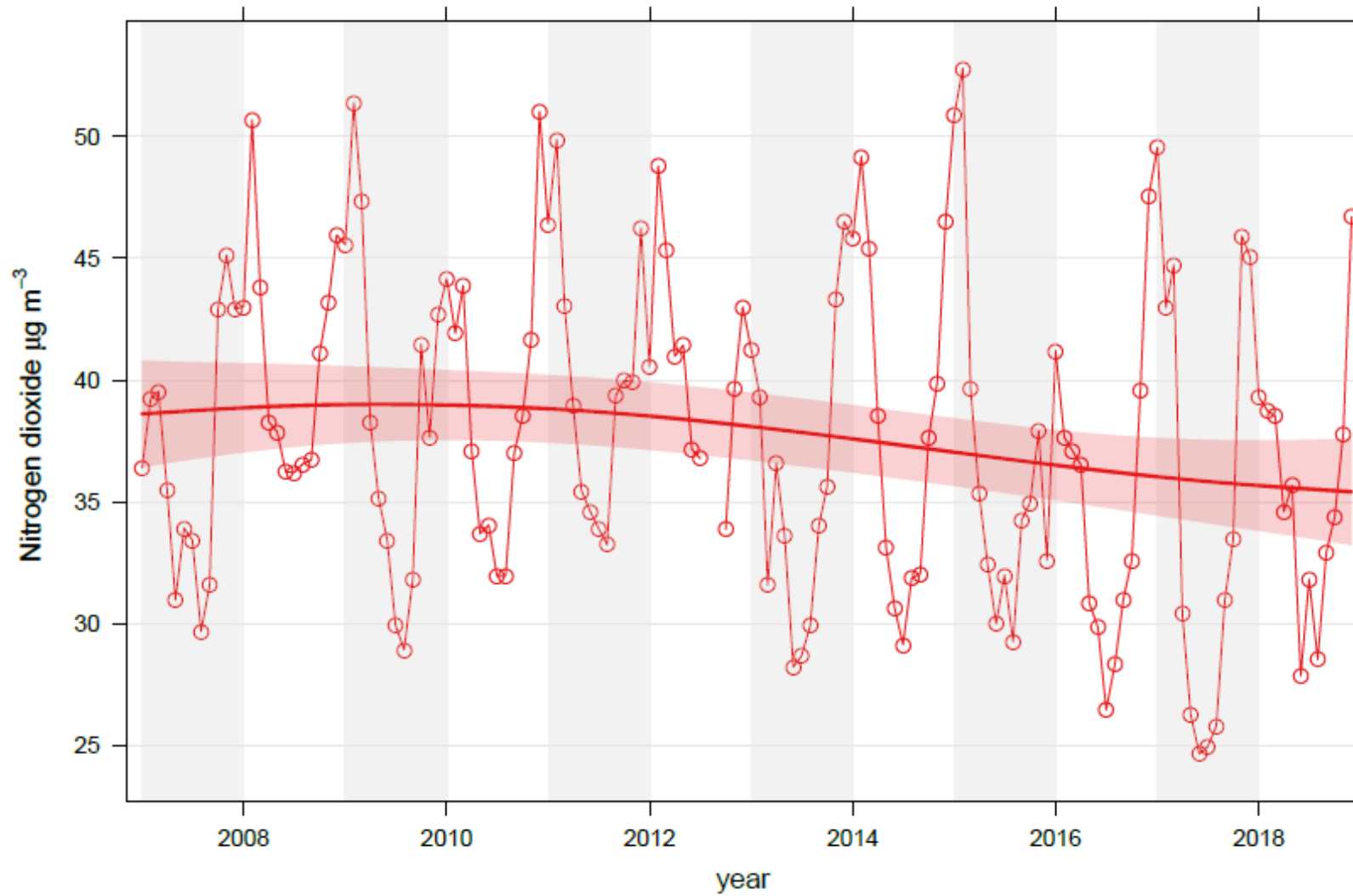
Automatic analyser – (AQMS) NO2 annual mean 2005-2018
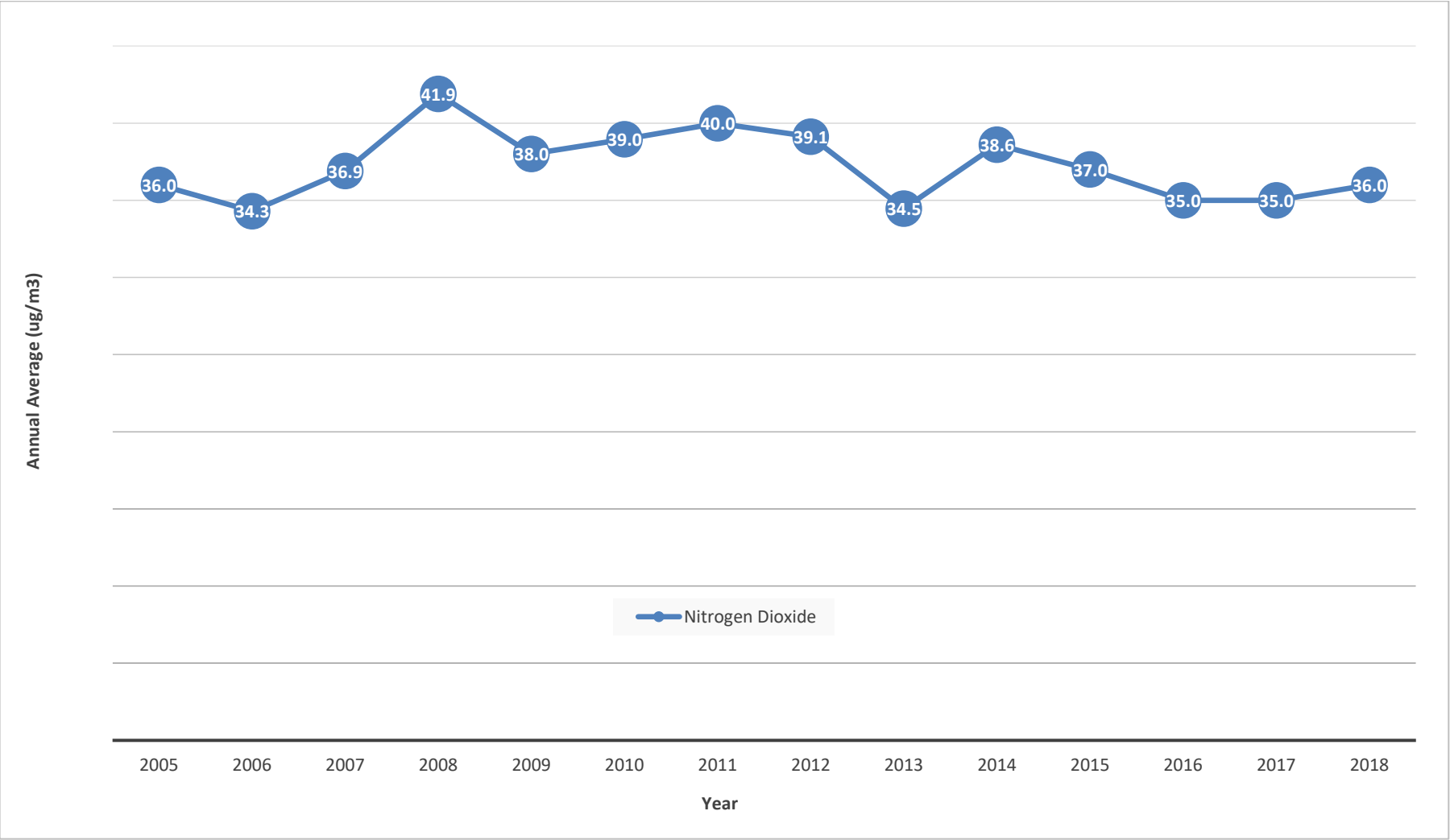
Diffusion Tubes trends (all locations)– 2007-2018
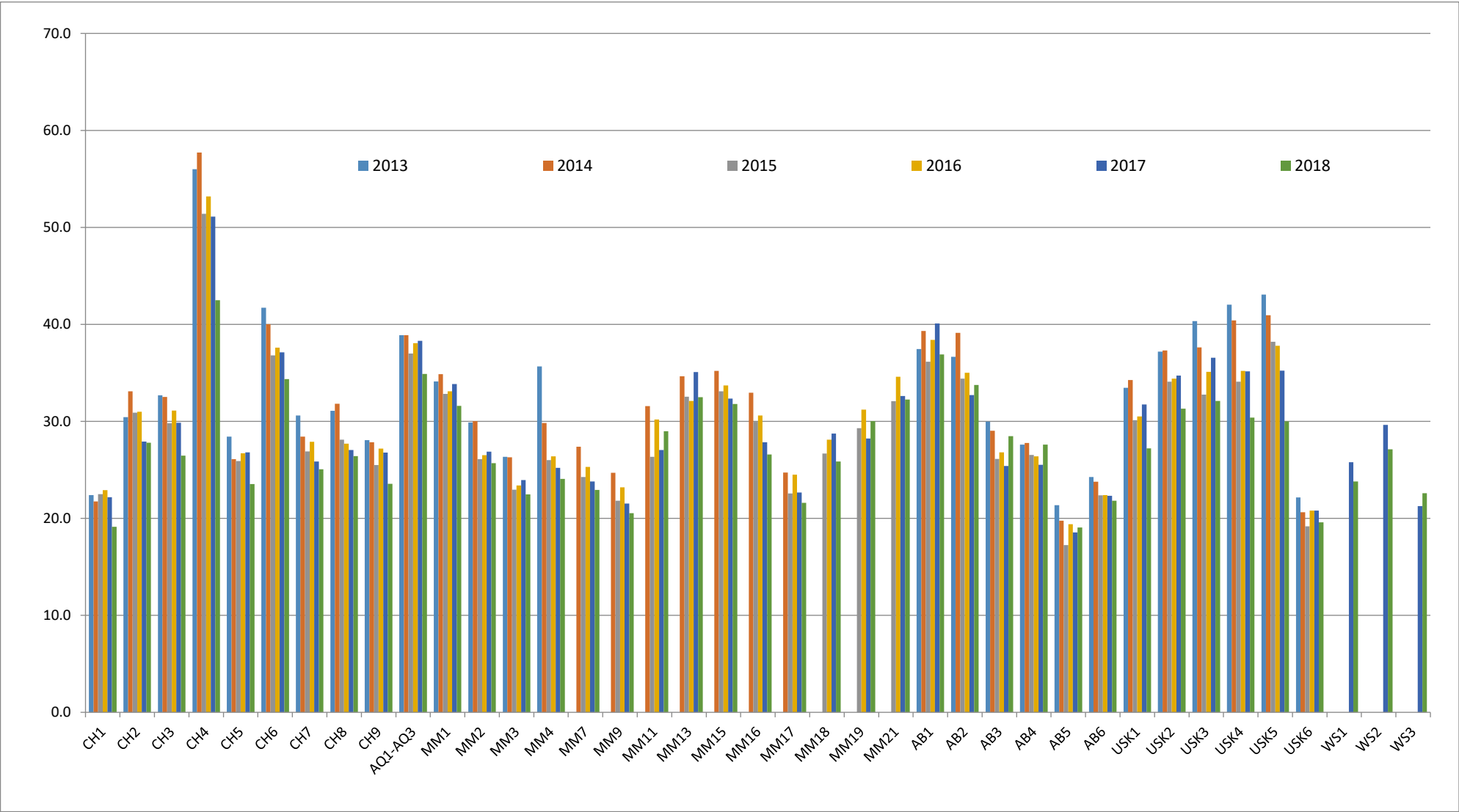
Table 2.4 – 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO₂ 1-Hour Means > 200µg/m³ [3]					
					2013	2014	2015	2016	2017	2018
AQMA	Roadside	Automatic Chemiluminescence	95	95	0	0	2	0	0	0
1-hour mean objective					**200µg/m³ not to be exceeded more than 18 times/year**					

Notes:

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/year) are shown in **bold.**

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

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

Table 2.5 – Annual Mean PM$_{10}$ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	PM$_{10}$ Annual Mean Concentration (µg/m³) [3]					
					2013	2014	2015	2016	2017	2018
AQMA	Roadside	Automatic TEOM-FDMS	93	93	19	18	17	18	16	18
Annual mean objective					**40µg/m³**					

Notes:

Exceedances of the PM$_{10}$ annual mean objective of 40µg/m³ are shown in **bold.**

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure 2.3 – Trends in Annual Mean PM$_{10}$ Concentrations

Automatic analyser – (AQMS) PM10 smoothed trend line 2007-2018

Monmouthshire County Council

Automatic analyser – (AQMS) PM10 annual mean 2005-2018
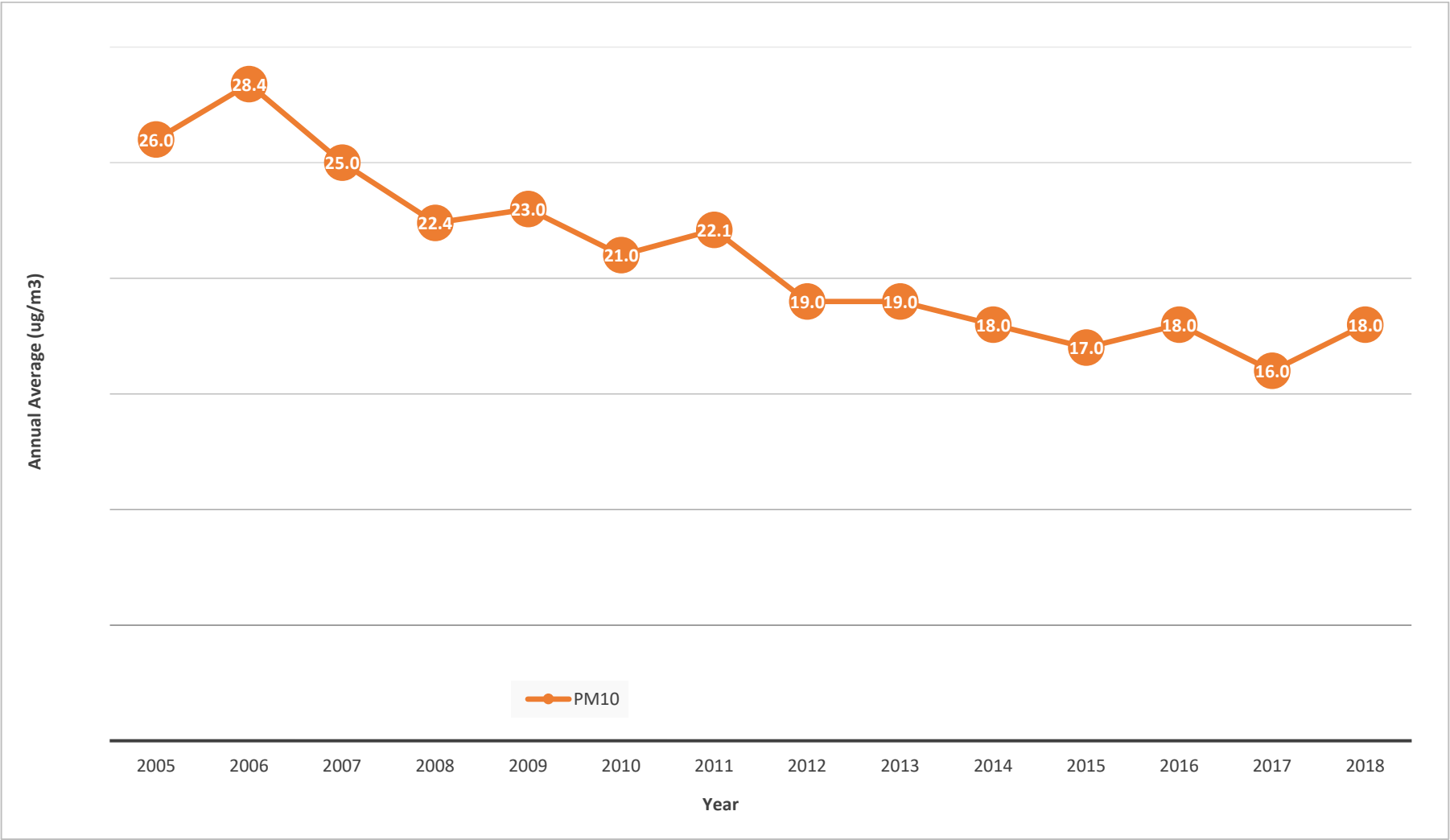
Table 2.6 – 24-Hour Mean PM$_{10}$ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	PM$_{10}$ 24-Hour Means > 50µg/m^3 [3]					
					2013	2014	2015	2016	2017	2018
AQMA	Roadside	Automatic TEOM-FDMS	93	93	4	2	5	1	2	0
24-hour mean objective					**50µg/m^3 not to be exceeded more than 35 times/year**					

Notes:

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

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

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

Table 2.7 – PM$_{2.5}$ Monitoring Results

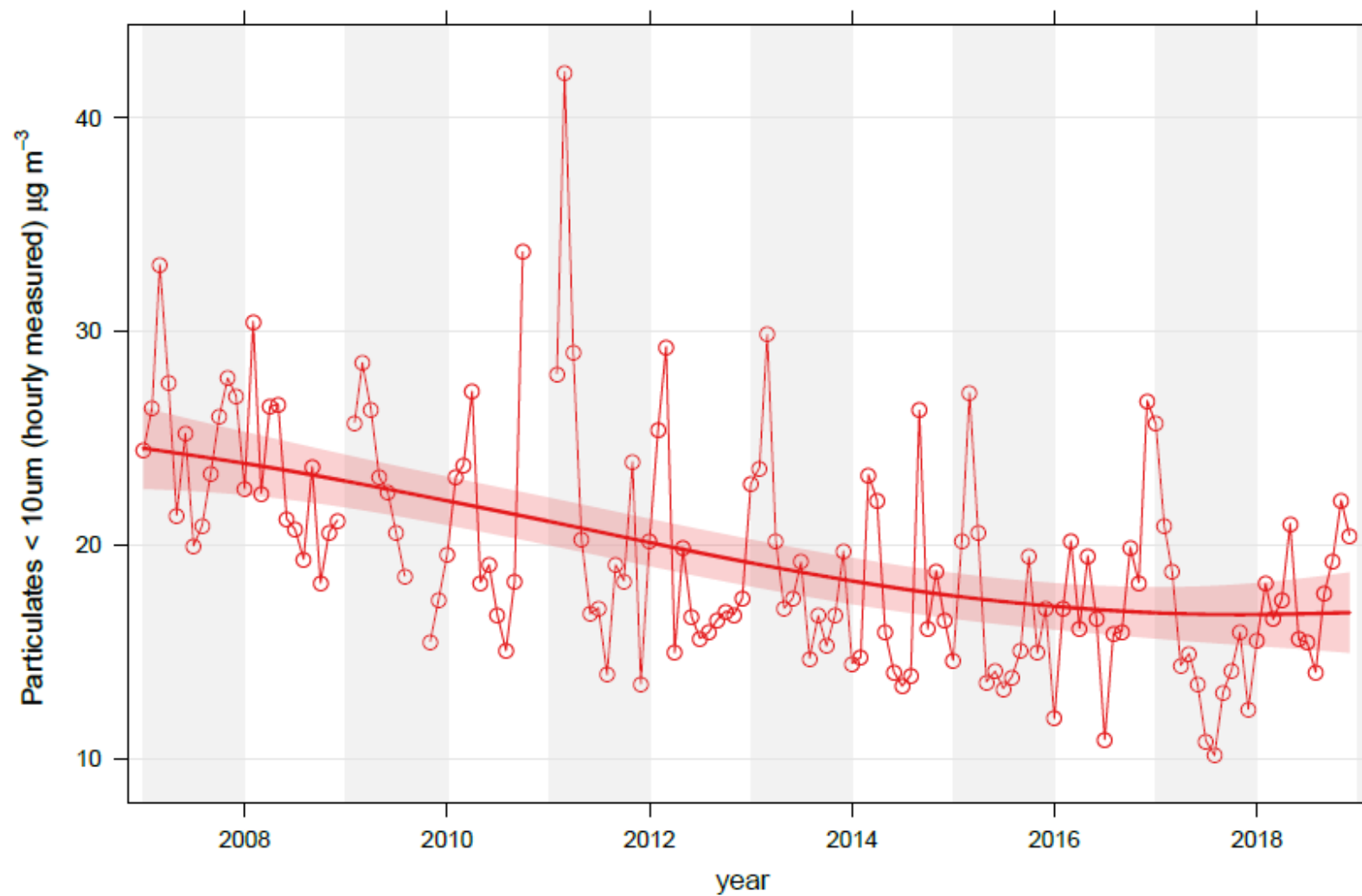| Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	PM$_{2.5}$ Annual Mean Concentration (µg/m³) [3]					
					2013	2014	2015	2016	2017	2018
AQMA	Roadside	Automatic TEOM-FDMS	93	93	14	14	10	11	10	10
Annual mean limit value				**25µg/m³**						

Notes:

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure 2.4 – Trends in Annual Mean PM₂.₅ Concentrations

Automatic analyser – (AQMS) PM2.5 smoothed trend line 2010-2018
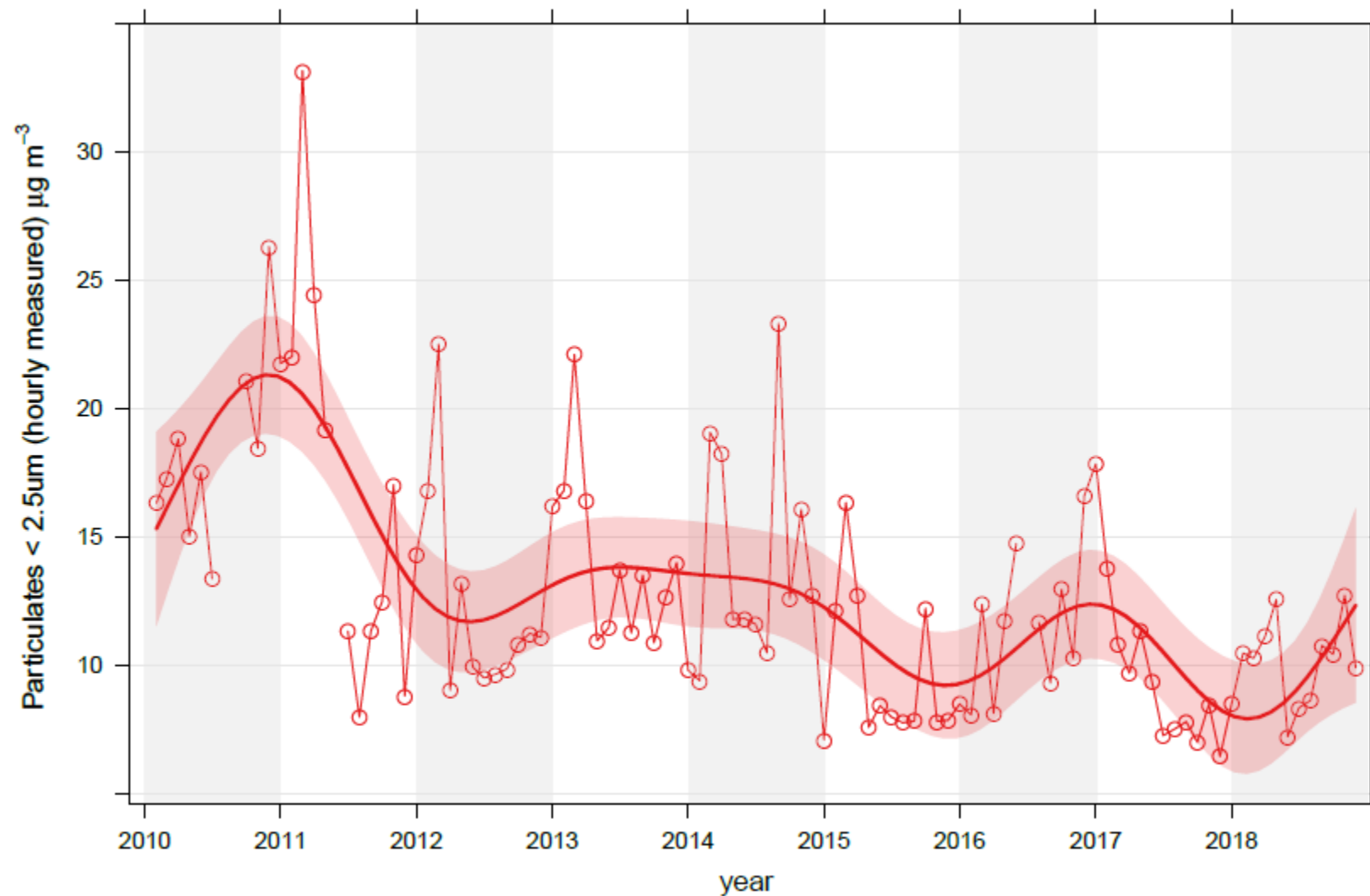
Automatic analyser – (AQMS) PM2.5 annual mean 2010-2018
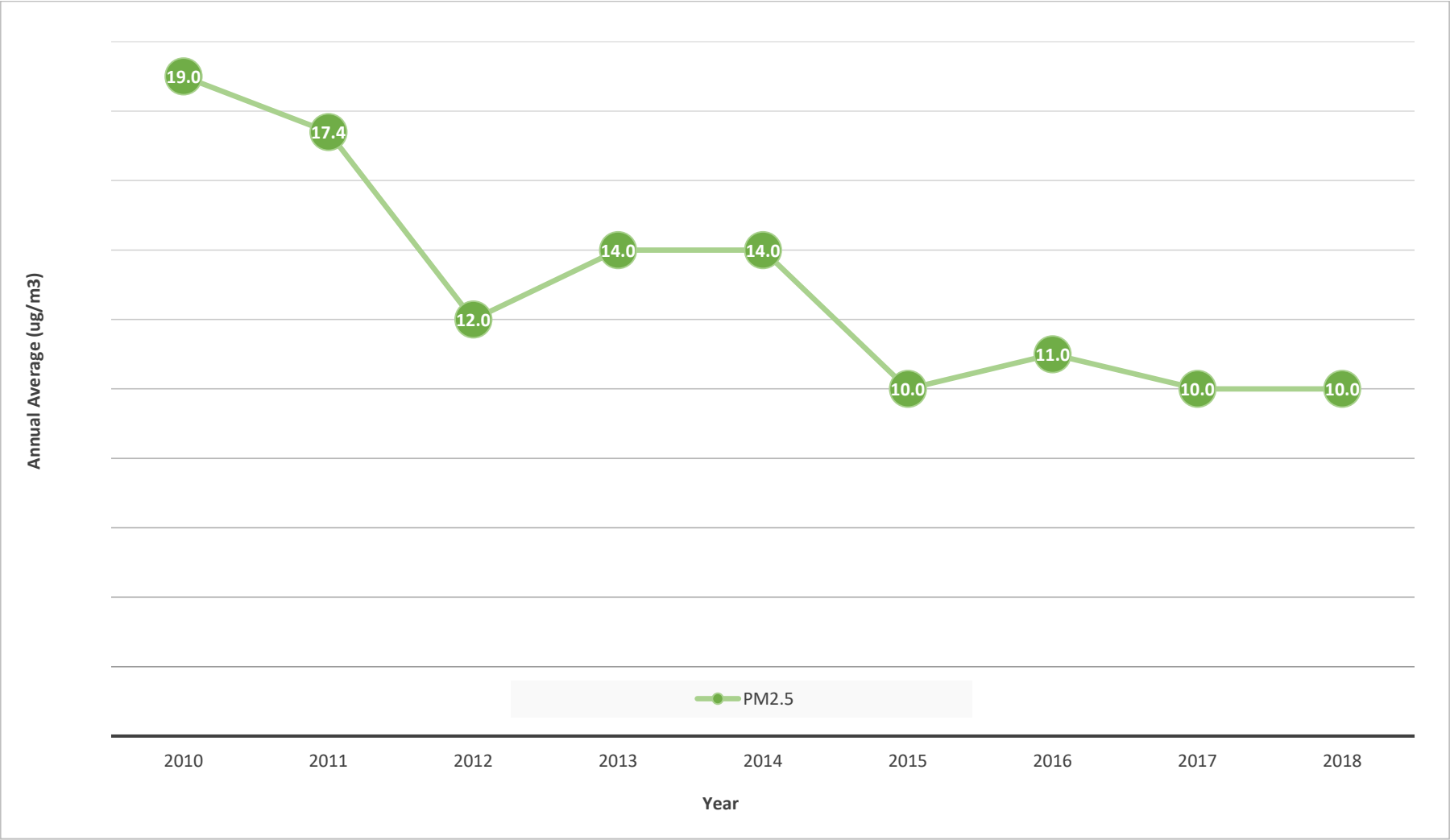
2.3 Comparison of 2018 Monitoring Results with Previous Years and the Air Quality Objectives

PM10

In 2018 there were no exceedances identified of the PM_{10} short term (24 hour average of 50 μg/m^3 not to be exceeded more than 35 times a year) or long-term objective levels (annual average of 40 μg/m^3) , or the World Health Organisation's guideline concentration of 20μg/m^3 annual mean or 50μg/m^3 24-hour mean.

PM2.5

In 2018, there were no exceedances of the $PM_{2.5}$ limit value (25 μg/m^3), however the Chepstow AQMS was at the World Health Organisation's guideline concentration of 10 μg/m^3, but has not exceeded it since 2016.

Nitrogen Dioxide

In 2018, there were no exceedances of the NO_2 short-term objective level of 200μg/m^3 not to be exceeded more than 18 times/year.

There was one exceedance of the NO_2 annual mean objective level measured by diffusion tube. The exceedance occurred in the Chepstow AQMA (monitoring reference - CH4) which recorded 42.5 μg/m^3.

The World Health Organisation guideline value for long term and short-term exposure for nitrogen dioxide is the same as the current objective levels set by the UK and EU.

2.3.1 Nitrogen Dioxide (NO$_2$)

In 2018, nitrogen dioxide concentrations in Monmouthshire decreased, including the Chepstow and Usk Air Quality Management Areas. This built upon a decrease in 2016, which stabilised in 2017, over most previous years. Concentrations in 2018 were the lowest they had ever been at most locations.

There was one exceedance of the NO$_2$ annual mean objective level measured by diffusion tube. The exceedance occurred in the Chepstow AQMA (monitoring reference - CH4) which recorded 42.5 µg/m^3.

Usk & Woodside

For the fourth year in a row, there were no exceedances of the annual mean objective level in the Usk AQMA. Usk concentrations generally decreased between 2012 and 2015, remained stable until 2017 and decreased in 2018. The three tubes in Woodside which were installed in 2017 were all below the objective level in 2018 and 2019, with the highest reading for all tubes in both years being 29.6 µg/m^3 it would appear that this part of Usk is not at risk of exceeding the nitrogen dioxide objective level, however monitoring is continuing in 2019. Two of the tubes decrease between 2017 and 2018 (by 2.5 and 2 µg/m^3 and one increased (by 1.5 µg/m^3). The highest concentration in this area in 2018 was 27.1 µg/m^3.

Chepstow

For the fourth year in a row, there was only one location that exceeded the annual mean objective level in the Chepstow AQMA. In past years, there have been three locations that were in exceedance.

The diffusion tube data indicated that concentrations decreased from 2012 until 2015 remained stable until 2017 and decreased in 2018. The automatic analyser showed a decrease from 2008 to 2018, with concentrations remaining somewhat stable between 2015 and 2018 of between 35 and 37µg/m^3. However, there was a 1.0 µg/m^3 increase in 2018 up from 35 in 2016 and 2017 to 36 in 2018.

The one exceedance still occurring is located at CH4 (Hardwick Hill). This location has exceeded the annual mean objective level every year since 2007.

CH4 increased concentration between 2007 and 2012 to a high of 60.3 µg/m^3. However, until 2018 it steadily decreased in concentration to the low 50's between 2015 and 2017. In 2018 there was a large decrease to its lowest recorded concentration of 42.5 µg/m^3. This represents an 8.6 µg/m^3 decrease between one calendar year. This is the largest change

between 2017 and 2018 concentrations in the county, and will be regarded with caution until further trends can be analysed.

The other two locations in Chepstow that have exceeded in the past are the automatic analyser, which last exceeded in 2011 and diffusion tube CH6 (Hill House) which last exceeded in 2014. CH6 has reduced from a high of 42.6 µg/m^3 in 2012 to its lowest concentration of 34.3 µg/m^3 in 2018.

CH2a in Chepstow is a kerbside location and not representative of public exposure, therefore the results have been distance corrected as per https://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html

Monmouth

Within Monmouth, monitoring is undertaken along the A40 and within the town centre. Again, concentrations over the last 5 years have generally decrease and then stabilised. For example, one of the longer-term monitoring locations (MM1 – Wyebridge Street) reached its highest concentration in 2012 of 39 µg/m^3, but since reduced and stabilised at 33-34 µg/m^3 up until 2017 but decrease to 31.6 in 2018.

Of the less well established locations (installed in 2014 and 2015), the majority decreased in 2017 with the exception of MM13 (Pike House) which increased by almost 3 µg/m^3 to 35.1 µg/m^3, however decreased in 2018 to 32.5.

MM18 (Monmouth School D&T block) increased in 2017 by 0.6 µg/m^3 to 28.7 µg/m^3, but deceased again in 2018 to 25.9 (its lowest concentration).

Monitoring location MM11 (Fence of Monmouth School), is located next to the School Playground, and therefore installed to indicate the possibility of an exceedance of the short term (1-hour nitrogen dioxide objective level of 200 µg/m^3 not to be exceeded more than 18 times a year. Guidance from DEFRA, based on studies states that if the annual mean objective is below 60 µg/m^3, the 1-hour objective is unlikely to be exceeded, and as MM11 has

consistently been in the high 20-low 30's since installation in 2014, MCC are confident that the 1-hour objective level is not being exceeded at this location.

In April 2018 MM21 (Priory Street, Monmouth) recorded a concentration of 106 µg/m^3. This is an unprecedented concentration for a monthly averaged diffusion tube in Monmouthshire, with 60.3 µg/m3 being the highest ever-recorded concentration by a diffusion tube in the county. Conversation with the laboratory did not identify an issue with the analysis, and the Highway section did not identify any unusual traffic or road works undertaken in that month.

Communication with DEFRA's helpdesk advised that the concentration only be used as part of the annual mean calculation if further readings also indicated concentrations at this level. No other reading in 2018 approached this concentration. The range of concentrations for the remaining eleven months were between 27.0 and 43.7. As a result, it does not appear appropriate to use the April concentration it would appear to be incorrect. Without April's reading the annual mean for MM21 is 32.2 and with the reading it is 37.7 µg/m^3, therefore there would still not be an exceedance of the objective level. Should this ever happen again at this location, the result for 2018 can be looked at again and the annual mean adjusted if necessary to show the occurance.

In Monmouth all locations apart from MM11 (Boys School Fence) decrease between 2017 and 2018.

Abergavenny

Monitoring in Abergavenny is mainly located along the A4143 (Merthyr Road), and potential issues have been identified at a pinch point between Llanfoist Bridge and Llanfoist Roundabout.

AB1 is not in an Air Quality Management Area, although due to increases recorded at the location since 2010, and as a result of an exceedance in 2012 (41.5µg/m^3) additional monitoring locations were set up along Merthyr Road in 2012 and 2013 and have remained in place since those dates. The cause of the increase is possibly due to the additional housing, and retail development that has occurred in Llanfoist and on Merthyr Road in recent years.

There could also have been some impacts in recent years with the Heads of The Wales (A465) duelling programme that has been occurring between Govilon and Brynmawr, and before that in Llanfoist.

AB1 is located on the north bound side of the road next to a fairly narrow bridge across the river Usk. This is the only foot and road bridge across the river to connect Llanfoist and Abergavenny. It is also next to a roundabout that provides access to a Supermarket, Llanfoist and the A465 itself, and there can be congestion at peak traffic times on the short stretch of road between the bridge and the roundabout.

On that stretch of road there is one house on the northbound side and a Kwik Fit garage, and a Public House and a row of cottages comprising 7 residential properties and one business on the southbound side. There is another diffusion tube monitoring location on the southbound side of the road (AB2) that was installed in 2012.

In 2017 AB2 (which is opposite AB1) recorded its lowest concentration at 32.7µg/m^3, in fact all diffusion tubes (AB2, AB3, AB4, AB5, AB6) located on Merthyr road with the exception of AB1 were lower in 2017 than any other year since installation (2012 or 2013).

In 2018 four of the six locations increase from 2017 and two decreased. This was unusual for the county as outside of Abergavenny only 3 other location increased.
However, AB1, which is the location of most concern, did decrease in 2018, from 38.0 in 2018 to 36.9 in 2018. Of the other five locations, only AB2 (opposite side of the road to AB1) recorded concentrations over 30 µg/m^3. AB2 was 33.8 and the other four ranged between 19 and 28.5. All location will remain in place in 2019; however, in 2020 consideration will be made to move some of the consistently lowest concentration tubes to the A40 through Abergavenny.

2.3.2   Particulate Matter (PM$_{10}$)

In 2018 there were no exceedances identified of the PM$_{10}$ short term or long-term objective levels. PM$_{10}$ concentrations have never exceeded the short- or long-term objective levels.

Since monitoring began in 2005 annual average concentrations have reduced steadily from 26 μg/m^3 in 2005 to 16 μg/m^3 in 2017 however increased to 18 μg/m^3 in 2018.

2.3.3   Particulate Matter (PM$_{2.5}$)

In 2018 there were no exceedances identified of the PM$_{2.5}$ limit value at the Air Quality Monitoring Station on Hardwick Hill, in the Chepstow Air Quality Management Area. PM$_{2.5}$ concentrations have never exceeded the EU limit Value. The highest concentration recorded was 19 μg/m^3 in 2010. Concentrations reduced to 14 μg/m^3 and then 12 μg/m^3, and have been steady since 2015 at 10 (2015), 11 (2016) and 10 μg/m^3 (2017 and 2018).

2.4   Summary of Compliance with AQS Objectives as of 2018

Monmouthshire County Council has examined the results from monitoring in the County. Concentrations in one area has been found to be close to the Objective, therefore further investigation is required before deciding on whether action is necessary.

Concentrations within the Chepstow AQMA still exceed the objective for long-term nitrogen dioxide, despite a large decrease between 2012 and 2018, therefore this AQMA will remain.

Concentrations of nitrogen dioxide have not exceeded within the Usk AQMA for four years, however MCC does not intend to revoke the AQMA until five years of non-exceedance have been achieved.

3.   New Local Developments

There are no specific new local developments confirmed that have not already been identified in previous reports.

There is concern that new developments in the south of the County and in Forest of Dean will impact on the Chepstow AQMA, and surrounding area. There are a number of developments proposed, and the Local Development Plan is being revised.

Air Quality is a consideration in the LDP and planning applications.

There is also concern regarding the impact the removal of the Severn Bridge Tolls will have on the south of the County, with increased commuting from Chepstow to Bristol, as people who work in Bristol purchase the lower priced houses in the Chepstow area. Transport studies are being undertaken by MCC and Welsh Government to determine the likely impact.

3.1   Road Traffic Sources (& other transport)

There are no newly identified road traffic sources since the last assessment.

3.2   Industrial / Fugitive or Uncontrolled Sources / Commercial Sources

There are no additional industrial, fugitive or uncontrolled sources identified.

3.3   Planning Applications

There are no new approved planning applications that have not already been identified in previous assessments.

3.4   Other Sources

There have been no Other Sources (bonfires, firework displays, domestic wood burners) that have contributed to identified air pollution.

Monmouthshire County Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

Monmouthshire County Council confirms that all the following have been considered:

•   Road traffic sources

•   Other transport sources

•   Industrial sources

•   Commercial and domestic sources

•   New developments with fugitive or uncontrolled sources.

4.   Conclusions and Proposed Actions

4.1   Conclusions from New Monitoring Data

This Progress Report identified one exceedance of the nitrogen dioxide annual mean objective level in Monmouthshire in 2018. The exceedance was on Hardwick Hill, Chepstow which is one of the two declared AQMAs.

The slight exceedance on Merthyr Road in Abergavenny identified in 2017, (due to elevated countrywide nitrogen dioxide levels in January and February 2017) did not re-occur in 2018. Therefore, an AQMA will not yet be declared, but monitoring will continue.

 There were no other exceedances of nitrogen dioxide in Monmouthshire, including in the Usk AQMA. The Usk AQMA will remain in place however, until five clear years of compliance have been achieved. Generally, nitrogen dioxide, PM_{10} and $PM_{2.5}$ concentrations reduced between 2011/12 and 2015 and have remained consistent since.

4.2   Conclusions relating to New Local Developments

There were no additional confirmed local developments in 2018, over those identified in the 2017 Progress Report.

4.3   Other Conclusions

Air quality appears to be improving in the two Air Quality Monitoring Areas, however the two Air Quality Action Plans will continue to be progressed through regular meetings of the Air Quality Steering Groups.

4.4 Proposed Actions

- No changes are proposed to the two AQMAs.

- Extended monitoring will continue in Abergavenny and Monmouth.

- Woodside monitoring will continue for 2019

- Pwllmeyric village had four diffusion tubes installed October 2018 and 2019 concentration will be published in the 2020 APR, however Oct, Nov and December results are shown in Appendix 1. Please note three of the four locations are roadside, with houses a significant distance away and are therefore distance corrected. The Appendix 1 results shows both location concentration and estimated receptor (house) concentration.

- One monitoring location was set up on the A40 in Abergavenny mid-2019, and this is likely to be extended in 2020.

- Action plan Steering Group meetings will continue to be held to attempt to achieve progress with the proposed measures and identify additional measures to improve air quality.

- A School air quality-monitoring project is being undertaken in 2018 and 2019 and will be reported on in next year's report.

- The Air Quality Progress Report will be completed in 2020.

References

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Monmouthshire County Council (2016) Progress Report

Monmouthshire County Council (2017) Progress Report

Monmouthshire County Council (2018) Progress Report

References

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

Glossary of Terms

Appendices

Appendix A: Monthly Diffusion Tube Monitoring Results

Table A.1 – Full Monthly Diffusion Tube Results for 2018

Location	Gradko	WAQF	Gradko - 20% TEA in Water											
			Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
38 Larkfield Park Chepstow	CH1	MNBC-036	23.1	23.0	23.4	19.1	16.5	14.9	19.1	17.4	20.9	23.9	23.1	2
Lamppost No. WH70, Newport Road, Chepstow	CH2a	MNBC-091	34.0	38.1	39.6	39.5	36.1	36.7	38.4	32.5	34.1	37.1	45.1	4
36 Wayside - Hardwick Hill Chepstow	CH3	MNBC-044	26.7	29.4	29.7	30.6	25.3	27.8	27.4	25.5	27.5	28.5	34.3	3
2 Hardwick Hill - Chepstow	CH4	MNBC-047	47.6	41.6	43.1	51.1	42.1	36.7	57.3	48.9	47.4	37.2	55.6	4
1 Ashfield House - Mount Pleasant	CH5	MNBC-048	26.8	21.9	25.8	23.1	20.7	16.2	25.6	25.2	30.6	24.4	28.3	3
Hill House -Mount Pleasant Chepstow	CH6	MNBC-049	40.3	36.6	43.8	39.0	33.6	29.1	34.8	29.5	32.2	35.7	48.9	4
2 Hardwick Terrace - Chepstow	CH7	MNBC-050	24.8	26.2	28.9	28.2	27.2	28.7	25.5	20.3	21.9	25.8	35.4	3
Moor Street Lamppost- Chepstow	CH8	MNBC-051	M	30.0	28.1	27.3	25.5	M	29.7	22.9	24.2	29.2	37.0	3
Restway Wall - Garden City Way	CH9	MNBC-053	25.1	24.0	25.3	28.2	24.8	23.9	24.8	23.5	24.6	27.2	31.2	2
AQMS - Hardwick Hill Chepstow 1	AQ1	MNBC-040	36.8	35.7	38.1	37.7	36.2	29.4	37.6	34.0	36.1	38.1	37.9	4
AQMS - Hardwick Hill Chepstow 2	AQ2	MNBC-041	39.8	34.7	42.1	41.1	36.8	30.4	38.1	34.8	38.6	35.7	42.1	4
AQMS - Hardwick Hill Chepstow 3	AQ3	MNBC-042	34.1	37.4	41.2	40.8	37.6	35.4	39.7	34.6	34.7	35.9	41.3	5
Lamppost NY237 - 1 The Chestnuts, Pwllmeyric	PWLL1	MNBC-104										41.6	50.5	5
Lamppost NY241 - The Cedars, Pwllmeyric	PWLL2	MNBC-105										28.2	41.7	3
Lamppost NY246 - Hill House, Pwllmeyric	PWLL3	MNBC-106										46.5	46.8	5
2 White Cottage, Pwllmeyric	PWLL4	MNBC-107										23.0	27.1	3
School House - Wyebridge St Monmouth	MM1	MNBC-054	37.9	33.4	34.6	35.2	32.0	26.6	40.2	30.6	30.9	34.6	35.6	4
Flat 1 - Granville St Monmouth	MM2	MNBC-055	24.1	25.9	30.4	29.9	29.4	26.4	32.4	23.4	26.5	24.6	29.7	3
Lamppost ME 145 - 21 St James Sq. Monmouth	MM3	MNBC-056	26.6	24.1	27.8	25.4	22.4	19.4	23.8	21.0	22.5	22.9	26.1	3
12A Monnow Street on St Johns Street, Monmouth	MM4	MNBC-058	M	27.1	28.2	27.3	23.4	21.6	25.4	23.2	25.7	24.4	27.2	3
Arka, Old Dixton Road, Monmouth	MM7	MNBC-084	24.5	25.3	27.1	28.7	24.7	21.8	26.6	22.2	19.8	24.1	27.1	2
1, The Shrubbery, Old Dixton Road, Monmouth	MM9	MNBC-086	23.3	24.9	23.7	21.4	19.8	21.4	23.0	19.4	19.7	22.2	23.5	2
Fence of Boys School Playground	MM11	MNBC-088	25.6	30.6	35.6	32.7	33.8	42.6	34.5	24.5	23.4	29.2	32.9	3
Pike House, New Dixton Road, Monmouth	MM13	MNBC-090	32.3	30.4	32.4	41.4	31.1	29.4	42.3	38.2	35.5	31.0	40.7	3
6 Monnow Street/Fancy Fred's, Monmouth	MM15	MNBC-093	32.9	35.0	34.6	34.6	35.8	33.7	41.3	30.3	31.3	33.4	32.4	3
Lamppost ME380 Adj 20A Monnow Street, Monmouth	MM16	MNBC-094	26.8	28.7	34.4	29.3	26.7	28.3	31.1	25.4	26.6	26.8	33.9	M
4 Agincourt Square - The Punch House	MM17	MNBC-095	22.5	29.1	26.9	22.5	23.1	19.7	21.8	19.4	19.2	23.1	27.0	2

Site	Site ID	Tube												
Monmouth School D&T Block	MM18	MNBC-096	27.1	29.1	30.4	30.0	28.0	24.6	36.1	25.8	24.4	26.0	27.8	28
Lamp post, 7 Ty Mawr, Monk Street, Monmouth	MM19	MNBC-098	30.1	33.4	34.3	32.2	36.0	36.7	34.0	25.9	25.3	32.5	36.2	3
Lamp post ME399,14 Victoria Place, Priory Street, Monmouth	MM21	MNBC-100	31.8	43.7	36.4	106.0	39.4	39.9	33.9	27.0	30.1	32.6	34.4	3
Lamppost MC178- Merthyr Rd, Abergavenny	AB1	MNBC-060	44.1	44.7	48.4	45.9	36.4	32.9	46.9	37.0	37.0	40.1	50.0	4
Back Clinic, 2a Bridge Cottages, Merthyr Rd Aber	AB2	MNBC-077	37.6	41.0	42.7	37.4	35.7	31.3	34.8	29.4	30.8	34.2	39.5	4
112 Merthyr Road, Abergavenny	AB3	MNBC-078	29.3	30.2	34.6	31.1	33.6	34.2	32.7	27.3	25.5	26.5	29.8	3
L/P Adj. 5 Coopers Way, Merthyr Rd, Abergavenny	AB4	MNBC-079	29.2	28.2	33.5	31.8	29.9	M	29.5	23.9	M	28.9	31.3	3
1 Usk View, Merthyr Rd, Abergavenny	AB5	MNBC-080	21.6	21.7	25.1	21.5	18.3	18.4	18.0	15.5	18.0	19.6	28.7	2
L/P No. MB991 ADJ,. 9&11 Merthyr Rd, Abergavenny	AB6	MNBC-081	28.3	24.8	28.4	23.0	21.7	21.8	20.0	19.0	18.1	23.3	27.3	2
14A Castle Parade - Usk	USK1	MNBC-061	31.9	28.5	31.4	16.1	25.3	Note1	30.9	26.4	27.3	32.7	34.9	3
Castle Court - Usk	USK2	MNBC-062	39.0	33.5	29.2	26.3	34.5	31.6	42.0	32.2	32.7	M	36.3	3
White Hart - 5 Bridge St Usk	USK3	MNBC-065	37.2	34.6	19.8	38.2	36.2	32.0	41.2	32.4	32.1	36.1	39.3	3
35 Bridge St - Usk	USK4	MNBC-066	37.5	27.6	15.5	26.8	36.6	30.6	36.8	29.9	32.2	36.5	41.8	4
16 Bridge St -Lamp Post MA 556 - Usk	USK5	MNBC-067	37.1	33.0	16.6	27.2	33.0	33.9	39.2	31.7	31.2	34.0	36.1	3
4 Usk Bridge Mews - Usk	USK6	MNBC-068	27.1	24.2	25.0	20.7	23.6	18.2	18.1	16.9	16.4	M	20.8	2
13 Woodside, Usk	WS1	MNBC-101	28.8	31.2	26.8	18.2	25.6	23.2	27.1	23.2	24.2	26.4	27.0	2
19 Woodside, Usk	WS2	MNBC-102	31.5	33.9	28.5	30.0	28.6	24.0	35.1	26.1	29.6	28.6	26.8	3
22 Woodside, Usk	WS3	MNBC-103	26.3	25.0	25.0	23.4	31.5	26.0	24.3	19.9	21.0	24.2	23.8	2
Travel Blank	TB		0.37	0.42	0.29	0.23	0.18	0.00	0.12	0.10	0.04	0.10	0.16	0.11

	NO₂ Mean Concentrations (µg/m³)														
													Annual Mean		
Site ID	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Raw**	**Bias Adjusted (0.92) and Annualised** [1]	**Distance Corrected to Nearest Exposure** [2]
CH1	23.1	23.0	23.4	19.1	16.5	14.9	19.1	17.4	20.9	23.9	23.1	25.1	20.8	19.1	19.1
CH2a	34.0	38.1	39.6	39.5	36.1	36.7	38.4	32.5	34.1	37.1	45.1	44.1	**37.9**	34.9	27.8
CH3	26.7	29.4	29.7	30.6	25.3	27.8	27.4	25.5	27.5	28.5	34.3	32.5	28.8	26.5	26.5
CH4	47.6	41.6	43.1	51.1	42.1	36.7	57.3	48.9	47.4	37.2	55.6	45.7	46.2	42.5	**42.5**
CH5	26.8	21.9	25.8	23.1	20.7	16.2	25.6	25.2	30.6	24.4	28.3	38.4	25.6	23.5	23.5
CH6	40.3	36.6	43.8	39.0	33.6	29.1	34.8	29.5	32.2	35.7	48.9	44.5	37.3	34.3	34.3
CH7	24.8	26.2	28.9	28.2	27.2	28.7	25.5	20.3	21.9	25.8	35.4	34.0	27.2	25.1	25.1

Site ID	NO₂ Mean Concentrations (µg/m³)												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw	Bias Adjusted (0.92) and Annualised [1]	Distance Corrected to Nearest Exposure [2]
CH8	M	30.0	28.1	27.3	25.5	M	29.7	22.9	24.2	29.2	37.0	33.1	28.7	26.4	26.4
CH9	25.1	24.0	25.3	28.2	24.8	23.9	24.8	23.5	24.6	27.2	31.2	24.7	25.6	23.6	23.6
AQ1	36.8	35.7	38.1	37.7	36.2	29.4	37.6	34.0	36.1	38.1	37.9	46.7	37.0	34.0	34.0
AQ2	39.8	34.7	42.1	41.1	36.8	30.4	38.1	34.8	38.6	35.7	42.1	45.2	38.3	35.2	35.2
AQ3	34.1	37.4	41.2	40.8	37.6	35.4	39.7	34.6	34.7	35.9	41.3	51.1	38.6	35.5	35.5
PWLL1										41.6	50.5	54.1	48.7	44.8	24.1
PWLL2										28.2	41.7	37.8	35.9	33.0	28.9
PWLL3										46.5	46.8	52.4	48.6	44.7	31.1
PWLL4										23.0	27.1	30.4	26.8	24.7	24.7
MM1	37.9	33.4	34.6	35.2	32.0	26.6	40.2	30.6	30.9	34.6	35.6	40.7	34.4	31.6	31.6
MM2	24.1	25.9	30.4	29.9	29.4	26.4	32.4	23.4	26.5	24.6	29.7	32.5	27.9	25.7	25.7
MM3	26.6	24.1	27.8	25.4	22.4	19.4	23.8	21.0	22.5	22.9	26.1	31.2	24.4	22.5	22.5
MM4	M	27.1	28.2	27.3	23.4	21.6	25.4	23.2	25.7	24.4	27.2	34.2	26.2	24.1	24.1
MM7	24.5	25.3	27.1	28.7	24.7	21.8	26.6	22.2	19.8	24.1	27.1	27.1	24.9	22.9	22.9
MM9	23.3	24.9	23.7	21.4	19.8	21.4	23.0	19.4	19.7	22.2	23.5	25.5	22.3	20.5	20.5
MM11	25.6	30.6	35.6	32.7	33.8	42.6	34.5	24.5	23.4	29.2	32.9	32.6	31.5	29.0	29.0
MM13	32.3	30.4	32.4	41.4	31.1	29.4	42.3	38.2	35.5	31.0	40.7	39.3	35.3	32.5	32.5
MM15	32.9	35.0	34.6	34.6	35.8	33.7	41.3	30.3	31.3	33.4	32.4	39.3	34.6	31.8	31.8
MM16	26.8	28.7	34.4	29.3	26.7	28.3	31.1	25.4	26.6	26.8	33.9	M	28.9	26.6	26.6
MM17	22.5	29.1	26.9	22.5	23.1	19.7	21.8	19.4	19.2	23.1	27.0	27.2	23.5	21.6	21.6
MM18	27.1	29.1	30.4	30.0	28.0	24.6	36.1	25.8	24.4	26.0	27.8	28.2	28.1	25.9	25.9
MM19	30.1	33.4	34.3	32.2	36.0	36.7	34.0	25.9	25.3	32.5	36.2	35.1	32.6	30.0	30.0
MM21	31.8	43.7	36.4	106.0	39.4	39.9	33.9	27.0	30.1	32.6	34.4	36.4	41.0	37.7	37.7
AB1	44.1	44.7	48.4	45.9	36.4	32.9	46.9	37.0	37.0	40.1	50.0	45.9	42.4	39.0	36.9
AB2	37.6	41.0	42.7	37.4	35.7	31.3	34.8	29.4	30.8	34.2	39.5	45.8	36.7	33.8	33.8
AB3	29.3	30.2	34.6	31.1	33.6	34.2	32.7	27.3	25.5	26.5	29.8	36.7	30.9	28.5	28.5
AB4	29.2	28.2	33.5	31.8	29.9	M	29.5	23.9	M	28.9	31.3	33.8	30.0	27.6	27.6
AB5	21.6	21.7	25.1	21.5	18.3	18.4	18.0	15.5	18.0	19.6	28.7	22.0	20.7	19.0	19.0
AB6	28.3	24.8	28.4	23.0	21.7	21.8	20.0	19.0	18.1	23.3	27.3	28.9	23.7	21.8	21.8
USK1	31.9	28.5	31.4	16.1	25.3	Note1	30.9	26.4	27.3	32.7	34.9	31.9	29.6	27.2	27.2
USK2	39.0	33.5	29.2	26.3	34.5	31.6	42.0	32.2	32.7	M	36.3	39.0	34.0	31.3	31.3
USK3	37.2	34.6	19.8	38.2	36.2	32.0	41.2	32.4	32.1	36.1	39.3	37.2	34.9	32.1	32.1

Site ID	NO$_2$ Mean Concentrations (µg/m³)												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw	Bias Adjusted (0.92) and Annualised [1]	Distance Corrected to Nearest Exposure [2]
USK4	37.5	27.6	15.5	26.8	36.6	30.6	36.8	29.9	32.2	36.5	41.8	37.5	33.0	30.4	30.4
USK5	37.1	33.0	16.6	27.2	33.0	33.9	39.2	31.7	31.2	34.0	36.1	37.1	32.6	30.0	30.0
USK6	27.1	24.2	25.0	20.7	23.6	18.2	18.1	16.9	16.4	M	20.8	27.1	21.3	19.6	19.6
WS1	28.8	31.2	26.8	18.2	25.6	23.2	27.1	23.2	24.2	26.4	27.0	28.8	25.9	23.8	23.8
WS2	31.5	33.9	28.5	30.0	28.6	24.0	35.1	26.1	29.6	28.6	26.8	31.5	29.5	27.1	27.1
WS3	26.3	25.0	25.0	23.4	31.5	26.0	24.3	19.9	21.0	24.2	23.8	26.3	24.6	22.6	22.6
TB	0.37	0.42	0.29	0.23	0.18	0.00	0.12	0.10	0.04	0.10	0.16	0.11			
Installed	03/01/18	31/01/18	28/02/18	28/03/18	02/05/18	06/06/18	04/07/18	01/08/18	05/09/18	03/10/18	31/10/18	05/12/18			
Removed	31/01/18	28/02/18	28/03/18	02/05/18	06/06/18	04/07/18	01/08/18	05/09/18	03/10/18	31/10/18	05/12/18	09/01/19			
Days Exposed	28	28	28	35	35	28	28	35	28	28	35	35			
Hours Exposed	672	672	672	840	840	672	672	840	672	672	840	840			

Notes:

Exceedances of the NO$_2$ annual mean objective of 40µg/m³ are shown in **bold**.

NO$_2$ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO$_2$ 1-hour mean objective are shown in **bold and underlined.**

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

(2) Distance corrected to nearest relevant public exposure.

The concentrations used in the report for annual mean are those found in the final column (Distance Corrected to Nearest Exposure)

Appendix B: A Summary of Local Air Quality Management

Purpose of an Annual Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in the Environment Act 1995 and associated government guidance. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas and to determine whether or not the air quality objectives are being achieved. Where exceedances occur, or are likely to occur, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) within 18 months of declaration setting out the measures it intends to put in place in pursuit of the objectives. Action plans should then be reviewed and updated where necessary at least every 5 years.

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

Air Quality Objectives

The air quality objectives applicable to LAQM in Wales are set out in the Air Quality (Wales) Regulations 2000, No. 1940 (Wales 138), Air Quality (Amendment) (Wales) Regulations 2002, No 3182 (Wales 298), and are shown in Table B.1.

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

Table B.1 – Air Quality Objectives Included in Regulations for the Purpose of LAQM in Wales

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Nitrogen Dioxide (NO_2)	200µg/m³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40µg/m³	Annual mean	31.12.2005
Particulate Matter (PM_{10})	50µg/m³, not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	18µg/m³	Annual mean	31.12.2010
Particulate Matter ($PM_{2.5}$)	10µg/m³	Annual mean	31.12.2020
Sulphur dioxide (SO_2)	350µg/m³, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125µg/m³, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266µg/m³, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	3.25µg/m³	Running annual mean	31.12.2010
1,3 Butadiene	2.25µg/m³	Running annual mean	31.12.2003
Carbon Monoxide	10.0mg/m³	Running 8-Hour mean	31.12.2003
Lead	0.25µg/m³	Annual Mean	31.12.2008

Appendix C: Air Quality Monitoring Data QA/QC

Diffusion Tube Bias Adjustment Factors

Since May 2010 Monmouthshire County Council has used diffusion tubes prepared and analysed by Gradko International Limited using 20% TEA in Water.

The most up to date (09/19 – September 2019) National Bias Adjustment Factor for Gradko International Limited for the 2018 calendar year is 0.92. This was based on 40 studies including the one undertook by Monmouthshire County Council. Previous bias adjustment factors for 2018 were published in March 2019 (0.93 based in 30 studies) and June 2019 (0.92 based on 37 studies)

http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

Factor from Local Co-location Studies

Monmouthshire County Council undertakes its own triplicate co-Location study to obtain a Local Bias Adjustment Factor, and that factor is shared with other authorities via the National Bias Adjustment Factor database.

The triplicate co-location study undertaken with the Chepstow Air Quality Monitoring Station showed good precision in each of the twelve months.

A local bias adjustment factor (BAF) has been calculated for the Hardwick Hill, Chepstow automatic site based on data from 12 months. The triplicate tubes in all months showed good precision with each other (with a Coefficient of Variation below 20% in each month (CV range was 1.1-8.0), and 100% data capture. The calculations are shown in Table C.1

Table C.1: Local Bias Adjustment Factor	
Triplicate Diffusion Tube mean	38
Automatic Monitor mean	36
Bias Adjustment Factor	0.96

With 95% confidence interval	0.9-1.02

Discussion of Choice of Factor to Use

The national bias adjustment factor based on the co-location studies of 40 local authorities was 0.92, whilst the local bias adjustment factor based on the Chepstow co-location study was 0.96. The national factor was used, as it included 40 studies of good precision.

PM Monitoring Adjustment

The particulate monitoring equipment is TEOM FDMS for part of the year and a BAM for the last part of the year and the results therefore do not require adjustment.

Short-Term to Long-Term Data Adjustment

All automatic monitoring had data capture of greater than 75%, therefore Annualisation (using a calculation to adjust the short-term data to long term data) is not required.

Diffusion Tube Nitrogen Dioxide Annualisation

Diffusion tube Annualisation has not been undertaken in 2018, as all locations had data capture above 75%. Table C.2 is not used. The four Pwllmeyric locations were installed in October 2018 to ensure they were ready for January 2019, and are therefore not included in the overall conclusions for this 2019 APR.

Table C.2 – Short-Term to Long-Term Monitoring Data Adjustment

Site	Site Type	Annual Mean ($\mu g/m^3$)	Period Mean ($\mu g/m^3$)	Ratio
Average				

QA/QC of Automatic Monitoring

The PM_{10} automatic monitor and Nitrogen Dioxide analyser has been part of the Automatic Urban and Rural Network (AURN) since January 2008.

The PM_{10} analyser was upgraded to a FDMS TEOM analyser in February 2010. At the same time a $PM_{2.5}$ TEOM FDMS analyser was installed and became part of the AURN. In September 2018, the TEOM FDMS analysers were replaced with two BAM analysers (Beta Attenuation Monitors).

The nitrogen dioxide Chemiluminescence analyser was upgraded to a ML 2041 NOx Chemiluminescence Analyser in January 2012.

The nitrogen dioxide analyser is serviced by Air Monitors Ltd and the Particulate Matter analysers are serviced by EnviroTechnology. Both are on a six-monthly service schedule. Automatic calibrations take place daily and a manual calibration check and filter change is carried out every 2 weeks. Ricardo-AEA undertake a 6 monthly audit of the site.

The data is collected and ratified by Ricardo-AEA Technology on behalf of the Welsh Air Quality Forum (WAQF).

QA/QC of Diffusion Tube Monitoring

Monmouthshire County Council uses Gradko for the diffusion tube supply and analysis. Gradko is assessed as part of the AIR-PT/WASP (Workplace Analysis Scheme for Proficiency) operated by the Health and Safety Laboratory (HSL) and demonstrated satisfactory performance for 100% of the results submitted in each round in 2018, as reported at the linked website :-

https://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html

A travel blank tube accompanies the exposed tubes and is kept in a refrigerator during the exposure period and Gradko keep an unexposed laboratory blank. The nitrogen dioxide concentrations reported in this report are not blank subtracted however. The travel blank concentrations for 2018 were:-

Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
0.37	0.42	0.29	0.23	0.18	0.00	0.12	0.10	0.04	0.10	0.16	0.11

Precision of the co-located diffusion tubes at the Chepstow Air Quality Monitoring Station were all good, each with a coefficient variation of less than 20% (maximum was 8%)

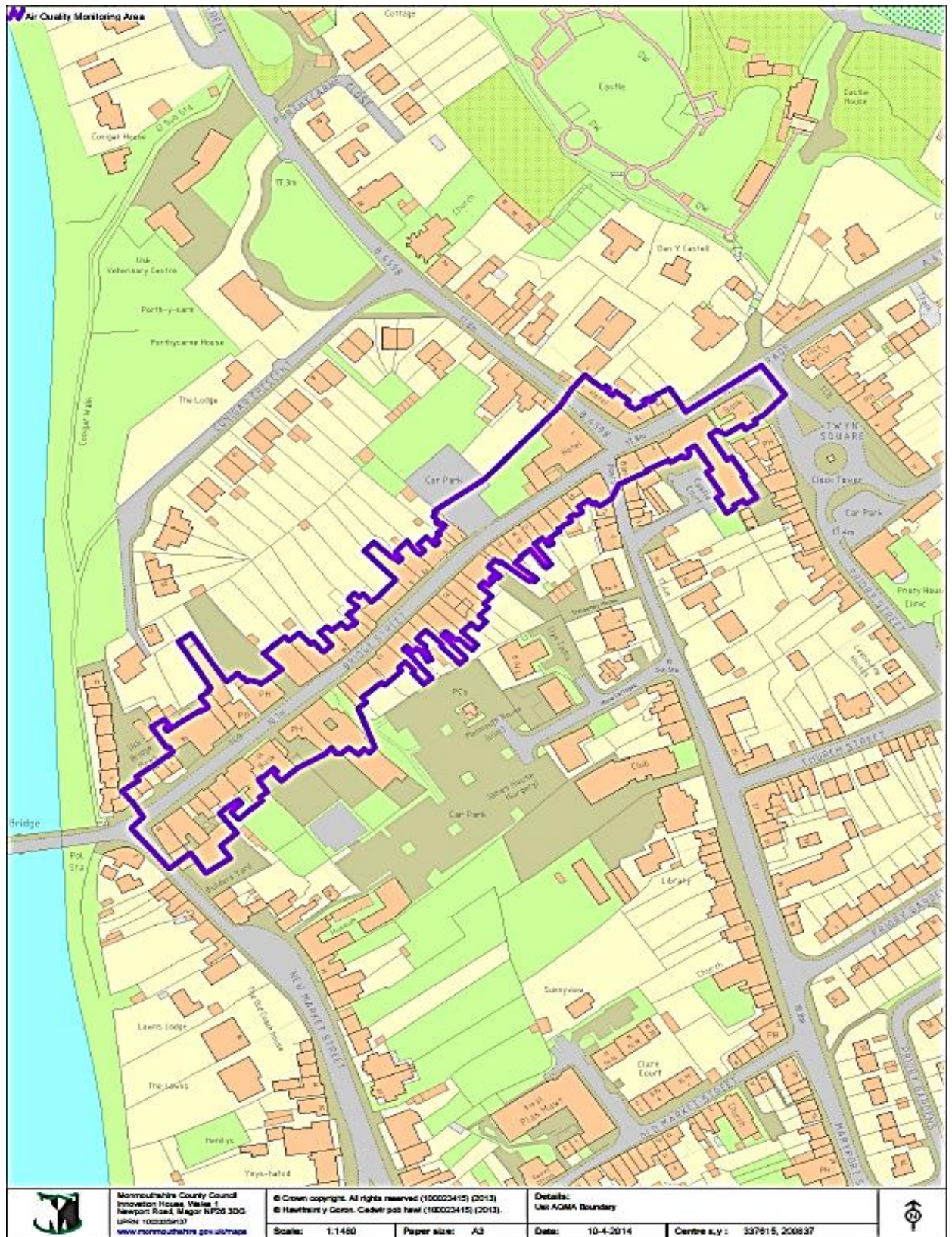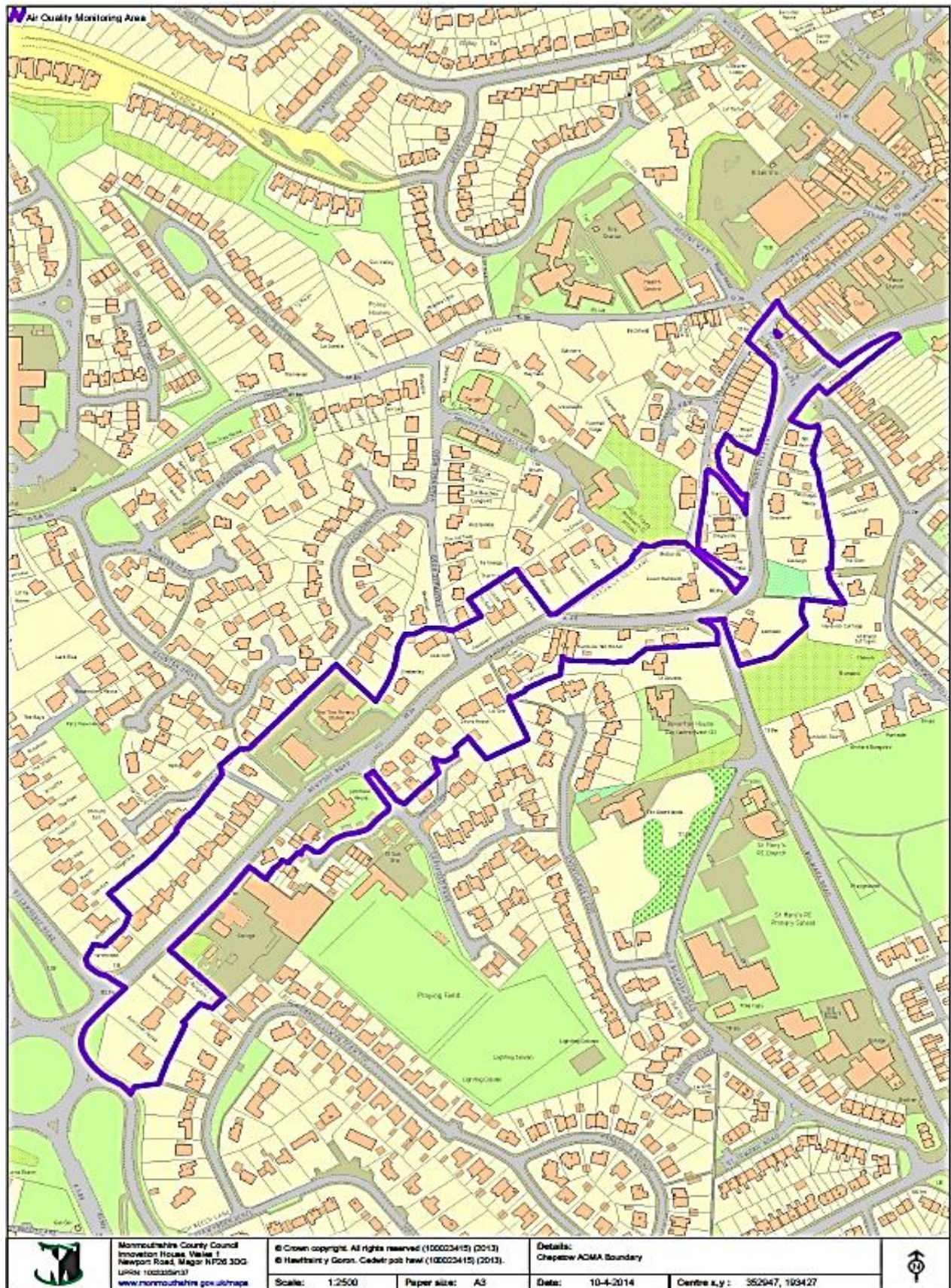# Appendix D: AQMA Boundary Maps

Figure D.1 – Usk AQMA Boundary Map

Figure D.2 – Chepstow AQMA Boundary Map

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
MCC	Monmouthshire County Council
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide
WG	Welsh Government

Glossary of Terms