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Monmouthshire County Council

2023 Air Quality Progress Report

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

Local Air Quality Management

Date: September 2023

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# Executive Summary: Air Quality in Our Area

## Air Quality in Monmouthshire

This 2023 Annual Progress Report (APR) presents the results of the air quality monitoring undertaken by Monmouthshire County Council in 2022. Previous reports (2011 to 2022) are available on the Council's website - <http://www.monmouthshire.gov.uk/air-quality>.

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 addition, one road is monitored for fine particles (PM<sub>10</sub> and PM<sub>2.5</sub>) as well as nitrogen dioxide.

In 2022 this monitoring was undertaken at a total of 45 locations: -

- 47 nitrogen dioxide diffusion tubes were located at 45 roadside locations (one location was a triplicate co-location study with the air quality monitoring station) in Chepstow, Pwllmeyric, Usk, Woodside, Monmouth, and Abergavenny.
- 1 roadside Air Quality Monitoring Station (AQMS) that house three automatic analysers to monitor nitrogen dioxide, and particulate matter (both PM<sub>10</sub> and PM<sub>2.5</sub>) (on the pavement of the A48 in Chepstow).

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.

Fine particles – PM<sub>10</sub> and PM<sub>2.5</sub> have never exceeded their relevant objective levels; however, nitrogen dioxide has exceeded its annual mean objective level of 40µg/m<sup>3</sup> in two locations. These have both been declared Air Quality Management Areas (AQMA): -

- Bridge Street in Usk – declared 2005.
- Hardwick Hill (A48) in Chepstow – declared 2007.

Both AQMAs have Action Plans and Steering Groups set up to identify options for improving air quality, the Action Plans are available from the following websites:

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

[https://uk-air.defra.gov.uk/aqma/local-authorities?la\\_id=403](https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=403)

Air Quality in Monmouthshire has been steadily improving since 2012, with nitrogen dioxide, PM<sub>10</sub> and PM<sub>2.5</sub> decreasing most years.

When looking at air quality trends in Monmouthshire a distinction can be made between pre-2020 concentrations and post-2020 concentrations, as the COVID-19 pandemic and associated lockdowns in 2020 and 2021 had a significant impact on the number of vehicles on the road network and therefore the amount of traffic derived pollution.

Before 2020, air quality was steadily improving year on year. For example, the highest recorded concentration of nitrogen dioxide in the county is on Hardwick Hill in the Chepstow Air Quality Management Area. In 2012 this location (CH4) recorded an annual average nitrogen dioxide diffusion tube concentration of 60.3µg/m<sup>3</sup> but by 2019 had reduced to 42.3µg/m<sup>3</sup>.

In 2012 four locations exceeded the nitrogen dioxide annual mean objective level of 40µg/m<sup>3</sup> (two in Chepstow and two in Usk), however by 2019 the only exceedance was CH4 in Chepstow. Usk's highest concentration of nitrogen dioxide was 49µg/m<sup>3</sup> (USK5 in 2007), and by 2019 the highest was 33.3µg/m<sup>3</sup> (USK3).

At the Air Quality monitoring Station, the highest concentrations recorded for the three pollutants monitored were 41.9µg/m<sup>3</sup> (nitrogen dioxide in 2008), 28.4µg/m<sup>3</sup> (PM<sub>10</sub> in 2006), and 19µg/m<sup>3</sup> (PM<sub>2.5</sub> in 2010). These had reduced to 39 µg/m<sup>3</sup>, 20 µg/m<sup>3</sup>, and 13 µg/m<sup>3</sup> respectively in 2019.

Then in 2020, due to the implications of the COVID pandemic and lockdowns, air quality in Monmouthshire improved significantly at all locations. The largest improvements were seen with reductions in nitrogen dioxide. The reduction in PM<sub>10</sub> and PM<sub>2.5</sub> was not as substantial.

In 2020 concentrations of all three pollutants were the lowest to date. The highest nitrogen dioxide diffusion tube concentration was  $31.6\mu\text{g}/\text{m}^3$  ( $\text{CH}_4$ ), and readings of the three pollutants monitored at the AQMS were  $26\mu\text{g}/\text{m}^3$  (nitrogen dioxide),  $17\mu\text{g}/\text{m}^3$  ( $\text{PM}_{10}$ ) and  $9\mu\text{g}/\text{m}^3$  ( $\text{PM}_{2.5}$ ).

In 2021 concentrations of nitrogen dioxide increased slightly as COVID-19 restrictions were lifted, however they remained lower than every other previous year other than 2020, this was the second year in a row with no exceedance of the nitrogen dioxide objective level anywhere in the county (at relevant exposure locations).  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$  decreased further in 2021. To date the lowest recorded concentrations of both sizes of fine particles was in 2021.

In 2022 nitrogen dioxide diffusion tube concentrations remained stable. Of the forty-five locations, twenty-nine reduced slightly (by between  $0.1\mu\text{g}/\text{m}^3$  and  $2.8\mu\text{g}/\text{m}^3$ ), fourteen increased slightly (by between  $0.1\mu\text{g}/\text{m}^3$  and  $3.1\mu\text{g}/\text{m}^3$ ), and two remained the same. The average of all forty-five locations in 2021 was  $21.9\mu\text{g}/\text{m}^3$ , and in 2022 it was  $21.7\mu\text{g}/\text{m}^3$ . This was a slight increase compared to 2020 ( $19.2\mu\text{g}/\text{m}^3$ , but a significant decrease over 2019 ( $29.9\mu\text{g}/\text{m}^3$ ). (The number of diffusion tubes and their locations remained the same in 2020, 2021 and 2022 thus allowing for this comparison).

Regarding the three analysers in the AQMA, in 2022 the annual average for nitrogen dioxide decreased by  $1\mu\text{g}/\text{m}^3$  ( $28\mu\text{g}/\text{m}^3$ ). As a result, 2022 was the second lowest year for nitrogen dioxide at the AQMA with only 2020 being lower.

However, the annual average for  $\text{PM}_{10}$  increased by  $2\mu\text{g}/\text{m}^3$  ( $18\mu\text{g}/\text{m}^3$ ) and  $\text{PM}_{2.5}$  increased by  $1\mu\text{g}/\text{m}^3$  ( $9\mu\text{g}/\text{m}^3$ ) in 2022 compared to 2021. As previously stated 2021 was the lowest year on record at the AQMA for both fine particle sizes, therefore whilst they did increase in 2022,  $\text{PM}_{10}$  was still lower than 2019 by  $2\mu\text{g}/\text{m}^3$  and  $\text{PM}_{2.5}$  was lower by  $4\mu\text{g}/\text{m}^3$  and matched the concentration recorded in 2020. This meant that 2020 and 2022 were the joint second lowest years for annual average  $\text{PM}_{2.5}$  concentrations.

Since 2020 there have been no measured exceedances of the nitrogen dioxide annual objective level (as measure by nitrogen dioxide diffusion tubes, and the automatic analyser)

anywhere in the county (at a relevant receptor e.g., house façade or school). Furthermore in 2022 there were no nitrogen dioxide monitoring locations above  $36\mu\text{g}/\text{m}^3$  (this considers the 10% accuracy level of a nitrogen dioxide diffusion tube), with the highest concentration being  $33.9\mu\text{g}/\text{m}^3$  at CH4.

There has never been an exceedance of the nitrogen dioxide hourly objective level, the  $\text{PM}_{10}$  annual objective level, nor the  $\text{PM}_{10}$  24-hour objective level (all measured by the automatic analyser). Whilst there are no  $\text{PM}_{2.5}$  objectives included in regulations for the purpose of LAQM in Wales, we make consideration as to whether monitored  $\text{PM}_{2.5}$  annual mean concentrations exceed either the  $25\mu\text{g}/\text{m}^3$  EU Limit Value or the  $10\mu\text{g}/\text{m}^3$  WHO Guideline. In 2022 neither the EU nor WHO value were exceeded (as measured by the automatic analyser).

## **Actions to Improve Air Quality**

Actions to improve air quality include regular meetings of the steering groups set up to progress the action plan measures of the two Air Quality Management Areas. In addition, the council began an anti-idling campaign – primarily targeting schools but will be rolled out to other locations. Schools were invited to design anti-idling posters in 2020 and winners were made up into signage to use around the county. The pandemic slowed this campaign, but the signage has now been produced and they were installed in 2022.

## **Local Priorities and Challenges**

Priorities for the local authority in 2023 to improve air quality is to work with partners, including Welsh Government to progress the Chepstow Transport Study, progress the Usk Town Strategic Master Plan, and progress the anti-idling campaign.

## **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

The conclusions of previous local action in relation to air quality is summarised below in chronological order. Each report can be found on Monmouthshire County Councils website.

Report Name	Date	Outcome
<b>Updating and Screening Assessment (Round 2)</b>	June 2003	<b>Detailed Assessment required for nitrogen dioxide at four roadside locations. Two in Monmouth, and one each in Usk and Chepstow</b>
<b>Interim Detailed Assessment (9 months monitoring)</b>	November 2004	AQMA required for Bridge Street in Usk. Chepstow and Monmouth monitoring results were marginal and AQMA's not declared
<b>Detailed Assessment (12 months monitoring)</b>	February 2005	AQMA for Usk confirmed. Chepstow and Monmouth did not require an AQMA
<b>Progress Report</b>	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
<b>AQMA declared for Bridge Street, Usk</b>	November 2005	The location is shown in Figure 1.1.
<b>Updating and Screening Assessment (Round 3)</b>	March 2006	Exceedances of Nitrogen Dioxide level on Hardwick Hill, Chepstow. Decided to progress straight to declaration of an AQMA
<b>AQMA declared for Hardwick Hill, Chepstow</b>	April 2007	The location is shown in Figure 1.2
<b>Further Assessment for Usk AQMA</b>	April 2007	Confirmed the AQMA should be retained with no changes to the boundary
<b>Further Assessment for Chepstow AQMA</b>	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
<b>Progress Report</b>	November 2008	NO2 exceedances limited to the two AQMA's.
<b>Updating and Screening Assessment (Round 4)</b>	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
<b>Usk Air Quality Action Plan</b>	September 2009	Agreed by Welsh Assembly Government in November 2009. 14 proposed measures to improve air quality
<b>Chepstow Action Plan Stakeholder Workshop Report</b>	November 2009	Outcomes of two stakeholder workshops with residents
<b>Progress Report</b>	May 2010	Only the two AQMA's exceeded nitrogen dioxide objective levels. No Detailed Assessment required.
<b>Hardwick Hill, Chepstow Origin &amp; Destination Study</b>	August 2010	Undertaken to support the Action Plan process
<b>Progress Report</b>	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
<b>Chepstow Air Quality Action Plan</b>	August 2011	Accepted by the Welsh Government in September 2011 with 29 proposed measures for improving air quality
<b>Updating and Screening Assessment (Round 5)</b>	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

<b>Progress Report</b>	April 2013	<p>Nitrogen dioxide was still the only pollutant that exceeded the objective level. The two Air Quality Management Areas still exceeded.</p> <p>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.</p> <p>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.</p>
<b>Progress Report</b>	April 2014	<p>Nitrogen dioxide was still the only pollutant that exceeded the objective level. The two Air Quality Management Areas still exceeded.</p> <p>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.</p>
<b>Monmouth Six Month Detailed Assessment</b>	September 2014	<p>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 NO<sub>2</sub> and PM<sub>10</sub>, PM<sub>2.5</sub> on the pavement of Wyebridge Street.</p>

<b>Updating and Screening Assessment (Round 6)</b>	April 2015	<p>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</p> <p>The full year's monitoring for Monmouth had confirmed the findings of the September 2014 six-month Detailed Assessment.</p> <p>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.</p> <p>There were no exceedances of nitrogen dioxide in Abergavenny, although two locations were close enough to warrant continued monitoring.</p>
<b>Progress Report 2016</b>	April 2016	<p>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.</p> <p>NRW's MMF monitoring in Monmouth was also summarised. It did not identify exceedance at a relevant receptor.</p>
<b>Progress Report 2017</b>	September 2017	<p>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.</p>
<b>Annual Progress Report 2018</b>	September 2018	<p>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 2016. Additional monitoring undertaken in Woodside south of Usk AQMA.</p>
<b>Annual Progress Report 2019</b>	September 2019	<p>Air Quality within the Chepstow AQMA continues to exceed the nitrogen dioxide annual mean objective level at one location. Fourth year with no exceedance in Usk AQMA, and first year with</p>

concentrations under  $36\mu\text{g}/\text{m}^3$  (10% of objective level). No exceedances elsewhere. Generally, concentrations in all towns were the lowest ever recorded.

<b>Annual Progress Report 2020</b>	September 2020	Air Quality within the Chepstow AQMA continued to exceed the nitrogen dioxide annual mean objective level at one location. Fifth year with no exceedance in Usk AQMA, and second year with concentrations under $36\mu\text{g}/\text{m}^3$ (10% of objective level). No exceedances elsewhere, and no PM10 or PM2.5 exceedances. Generally, concentrations in all towns were similar to the previous year but slightly higher.
<b>Annual Progress Report 2021</b>	August 2021	Report for the COVID pandemic identified no exceedances of any air quality objective level and all concentrations the lowest to date by a significant degree. The sixth year with no exceedances in Usk and third below $36\mu\text{g}/\text{m}^3$ . The only year to date with no exceedances in Chepstow AQMA
<b>Annual Progress Report 2022</b>	September 2022	<p>Nitrogen dioxide emissions in 2021 increased slightly over 2020, however remained significantly lower than 2019, prior to COVID-19. They remained lower than every other previous year other than 2020. PM<sub>10</sub> and PM<sub>2.5</sub> decreased further in 2021. To date the lowest recorded concentrations of both sizes of fine particles was in 2021.</p> <p>Seventh year in a row with no nitrogen dioxide exceedance in Usk (fourth below <math>36\mu\text{g}/\text{m}^3</math>), and the second with no exceedance in the Chepstow AQMA (or anywhere with relevant exposure in Monmouthshire).</p>

## 1.2 Air Quality Management Areas

Air Quality Management Areas (AQMA) 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](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 <sub>2</sub> annual mean	There have been improvements in air quality in the AQMA. Over the last 8 years there have been no exceedances, and under 10% of the Objective level for 5 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	<a href="https://www.monmouthshire.gov.uk/mcc-apr-2019">MCC APR 2019 (monmouthshire.gov.uk)</a>
Hardwick Hill, Chepstow	NO <sub>2</sub> annual mean	There have been improvements in air quality since 2017. One location continued to exceed up to 2019, but did not exceed in 2020-2022	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	<a href="https://www.monmouthshire.gov.uk/chepstow-aqap-final-31-august-2011.pdf">Chepstow-AQAP-Final-31-August-2011.pdf (monmouthshire.gov.uk)</a>

AMQA boundary maps within Monmouthshire can be viewed at [https://uk-air.defra.gov.uk/aqma/local-authorities?la\\_id=403](https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=403) and are included in Appendix D.



## 1.3 Implementation of Action Plans

Monmouthshire County Council has taken forward several measures 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 each designated 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.
- Starting a new Strategic Vision for Usk and Llanbadoc that is scoping options for various town improvements, including traffic and air quality issues.
- Completion of a WelTAG (Welsh Transport Appraisal Guidance) stage 2 assessment for air quality-based improvements in Chepstow.
- Completion of WelTAG stage 1 study for improvements to High Beech Roundabout in Chepstow.
- Implementation of anti-idling campaign with school designed signage and enforcement officer patrols at hotspots (e.g., schools).

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

- WelTAG study Stage 2 for High Beech Roundabout (Chepstow)
- Next stage of WelTAG study to be determined.
- Progress Usk and Llanbadoc Strategic Masterplan
- Progress of the 4 Active Travel Schemes that secured WG funding

**Table 1.2 – Progress on Measures to Improve Air Quality**

Usk Action Plan

The original 2009 Action Plan was reviewed and updated in January 2023 as most measures had either been successfully completed or deemed unviable or no longer valid. Outstanding measures were carried forward into the below 2023 Plan. Previous progress tables are still available in the 2022 Annual Progress Report available on MCC’s website.

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	Procurement of ANPR traffic data and commission of parking survey to help inform future actions	MCC Highways	Planning/Scoping	ANPR Data and parking survey report	None	Parking Survey/Traffic data collected	Carparking Review due 23/24	
2	Traffic Enforcement Both 20mph zones by police and double yellow line parking by MCC Civic Enforcement Officers	MCC Highways & Police	Active	Reduction in speeds and illegal parking	Reduction in speeds and reduced illegal roadside parking	CEO make regular visits	Completed but enforcement will be ongoing	Implementation of 20mph on Bridge Street in 2018 and MCC proactive enforcement of double yellow line parking coincided with a significant improvement in air quality.
3	Town wide parking strategy Traffic Regulation Orders to restrict parking or limit waiting	MCC Highways	Active	Final Parking Strategy Increase in EVC points in carparks	EVC points installed in two carparks. Carpark Signage Improved	EVC points installed in two carparks. 8 in Maryport South & 4 in Maryport North	A County wide carparking strategy is going to be undertaken late 2023. 2025	Improvements to town parking with good access to EVC will encourage uptake of EV in the town, and reduce roadside parking

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
	and improve pedestrian amenity and traffic flow.  Improve carparks and introduce EVC points, consider residents parking permits and carpark charging or time restrictions							creating congestion and thus improve air quality
4	Improved Public transport – additional bus routes to Pontypool & Abergavenny	MCC Transport Planning				Data gathered identified that funding is not available, and usage is down.	2028 – unsure of viability at the moment due to lack of funding and lack of bus usage	Improved public transport will aid in the reduction of vehicles in the AQMA
5	HGV Lorry Watch to continue with letter warnings and enforcement by MCC.	MCC Trading Standards	Active	Data relating to numbers of HGV's reported, and action taken against companies in breach of the RTO. Reduction in numbers of HGVs in the AQMA	Start date 20/3/2013. Total = 2569 Warnings = 128 Ongoing – 5 NFA - 2436	from 24/5/2022 to 24/5/2023 Total = 12 Warnings = 0 Ongoing – 5 NFA - 7	Ongoing	A reduction in HGV's will not only have a direct air quality improvement by removing their emissions, but also reduce congestion at narrow pinch points like Usk Bridge
6	Improving Active Travel, including connecting Coleg Gwent campus, MCC offices (e.g.,	MCC Active Travel			MCC working through the stages of the Active Travel Act.	Survey going through comms for public consultation (Usk to Little Mill consultation) two	2028	Improvements to Active Travel routes to/from and around Usk to enable residents and visitors to

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
	utilising the former railway line as a high-quality pedestrian cycle route) and Usk Island to the town and the two Sustrans routes (423 and 42).  Improvement of Sustrans routes  Create an active travel hub in Twyn Square				Specific work to create new walking and cycling connections to Coleg Gwent and MCC County Hall, and then South towards Pontypool. – Planning applications made	options – railway line or alongside the road route.  Proposed shared use footpath between Lady Hill and Usk School – to better enable children and parents to walk to school and improve access into town. Look to secure funding in 2024		safely walk and cycle and reduce vehicle usage to improve air quality and general health
7	Increase the number of public transport services to and from Usk. To include community transport	MCC Transport Planning			Bus companies report loss of money from routes and require additional MCC funding. Currently MCC priority is to return bus services to previous levels		2028	Improved public transport will aid in the reduction of vehicles in the AQMA
8	Contain indirect emissions from future development and from changes of land use	MCC Planning/Environmental Health	Active	Numbers of planning applications consulted on with air quality implications	Planning aware of AQMA and actively consult with Environmental Health			By ensuring local developments are planned with methods to reduce their impact on local air quality. Could be significant

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
	that would generate traffic							depending on number of applications
9	Bike Hire Scheme from Coleg Gwent	MCC Active Travel		Implementation of scheme and uptake		Initial survey concluded - Usk is a small community, and this would have to be a volunteer driven	Uncertain – needs a volunteer led approach. To be further investigated through Town Masterplan process	Provide a hub for MCC staff, students and visitors to cycle into Usk rather than drive.
10	Work with school and others to produce community and school traffic plan	MCC Education		School Traffic Plan and reduction in idling at school, and reduction in school vehicle trips	School signed up to ECO schools with diffusion tube study. MCC undertaken sensor study. School Governor on AQ steering group	Anti-Idling group set up within MCC to promoting anti idling focused on School pick up and drop off times. Signage installed. MCC appointed School Travel Plan Officer who is working with School to produce their own TP	School's first Travel Plan should be completed in the 23/24 year	School plan could help educate parents' and teachers to walk/cycle
11	Support & promote facilities for cyclists at school and in town centres	MCC Active Travel			Cycle parking installed on Bridge Street		Ongoing - as need arises, new facilities will be provided	Potential reductions in emissions if modal shift from car to cycling.
12	Public Realm improvements to Twyn Square (e.g. remove roundabout, restrict	MCC				Usk Masterplan undergoing consultation. This will be the driver	2028	Make Twyn Square more pedestrian friendly to

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
	traffic, widen pavements, provide café/pub outside seating areas, improve green infrastructure)							encourage walking through town rather than driving
13	Pedestrian priority interventions for Bridge Street to reduce traffic, and encourage shoppers	MCC				Usk Masterplan undergoing consultation. This will be the driver	2028	Make Bridge Street more pedestrian friendly to encourage walking through town rather than driving, and discourage through trips
14	Implement new 20mph speed limits/ zones – Bridge Street Zone has been completed, other zones in the town could be beneficial)	MCC Highways	Implementation 2023	Reduced speeds	Bridge Street made 20mph in 2018	Plans completed for Usk wide 20mph	Usk 20mph zone to be implemented September 2023	A town wide 20mph could reduce acceleration/braking and congestion, and encourage walking/cycling. Bridge Street 20mph started in 2018 and corresponded to an improvement in air quality
15	River Usk Pedestrian Bridge (part of Active Travel) First – assess strategic need as part of active travel strategy. If case undertake feasibility	MCC Active Travel/Planning		Installation of Bridge Bridge usage Less traffic due to improved pedestrian access	Usk Masterplan undergoing consultation. This will be the driver	Usk Masterplan undergoing consultation. This will be the driver	No Estimate yet. This is a big-ticket item that will be included in the town strategic plan design	Usk Bridge is narrow with a pedestrian pavement. This creates congestion when large vehicles cross and discourages walking into town. A dedicated

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
	assessment & determine location, costs, funding, design.			Improved traffic flow due to removal of pedestrians on vehicle bridge				pedestrian bridge would alleviate both issues

### Chepstow Action Plan

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 several informal cars sharing	Transition Chepstow have	Ongoing	Depending on the uptake – and provided the car sharing

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
					locations people use. MCC is looking in =to ways to formalise them	taken lead in identifying places for car sharing carparks and using an app to advertise them.  One such location is Chepstow Racecourse. MCC currently looking into finding a gate for the carpark so the Racecourse will allow the use of its Car park for this purpose		removes vehicles from the AQMA.
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).



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
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 Quality will be a factor.	Ongoing	In the long term could be significant if affects major developments.  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	Considered again in 2018 WeITAG study but not recommended for progress.  WG undertaken Stage 1 WeITAG	Several years after Station Road improvements to allow monitoring and improvements in car engines.	Localised improvements round the Roundabout. Potential improvements on the A48 assuming reduced queuing 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
					works including Station Road junction improvement and Bulwark junction improvement	study in 2020. Stage 2 expected to be completed by April 2022	Stage 2 due by April 2022	
11.	Target schools Traffic	MCC in partnership	Ongoing	Number of Travel Plans in place	Walking buses being organised by Transition Chepstow	Env Health installed air quality sensor at Chepstow Comp in Summer 2018. Hopeful the data will be used by the school as well to educate pupils, and have an impact on parent's school runs	Sensor installed. Monitoring in progress  Work with school over next 12 months to try to include the data in education	Could potentially provide reductions in emissions at locations close to schools, or at congestion hotspots.
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	Racecourse require a gate/barrier	n/a	Park and Ride on racecourse likely to cause some

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
					from racecourse complete.  Improvements made to the carpark to enable additional parking and room for buses	before allowing it to be used. MCC looking into finding.  Considered in 2018 WelTAG Stage 1 and recommended for further consideration at stage 2		emissions reductions on Hardwick Hill.
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 routes 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

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
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 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	No specific progress	n/a	n/a

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
					2015/16 and will not progress at this time			
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
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	Several 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 Racecourse	Considered in 2018 WelTAG Stage 1 and recommended for further	n/a	Park and Ride on racecourse 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
						consideration at stage 2		
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 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

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

### 2.1 Summary of Monitoring Undertaken in 2022

#### 2.1.1 Automatic Monitoring Sites

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

Monmouthshire County Council undertook automatic (continuous) monitoring of three pollutants at one site during 2022.

Table 2.1 presents the details of this site. 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 analysers are 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.

Maps showing the location of the monitoring sites are provided in Figure 2.1

The Chepstow AQMS became part of the UK's Automatic Urban and Rural Network (AURN) in January 2008. In February 2010 the PM10 monitor was upgraded to a TEOM-FDMS (Filter Dynamics Measurement System) analyser and a TEOM-FDMS PM2.5 analyser was introduced. TEOM-FDMS monitors are accepted as giving results equivalent to the European Gravimetric Standard Method. The analysers were Thermo Scientific rp Series. There were 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 PM10 and PM2.5 data reported for January to July 2018 is TEOM-FDMS data and August 2018 onwards is BAM data.

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

On 7th November 2019, the ML2041 NOx Analyser was then replaced with an API T200 NOx gas analyser.

In 2022, 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, PM-head cleaning, 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-Automating Monitoring Sites**

### **Diffusion Tubes**

Monmouthshire County Council undertook non- automatic (passive) monitoring of NO<sub>2</sub> at 44 sites during 2022. Table 2.2 presents the details of the sites. In addition to the discrete 44 diffusion tube sites, three tubes are also co-located with the Chepstow AQMS – (next to the NO<sub>2</sub> analyser's inlet) as part of a local and national bias adjustment study. With this information all the diffusion tubes can be adjusted to reflect atmospheric concentrations more accurately.

Maps showing the location of the monitoring sites are provided in Figure 2.2.



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) and bias adjustment for the diffusion tubes are included in Appendix C.

**Table 2.1 – Details of Automatic Monitoring Sites**

Site ID	Site Name	Site Type	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 <sub>10</sub> PM <sub>2.5</sub>	Beta Attenuation Monitoring (BAM)	2.5	7.5m	3
						NO <sub>x</sub> NO <sub>2</sub>	Chemiluminescence			

Figure 2.1 – Map of Automatic Monitoring Site (AQMS) <https://airquality.gov.wales/>



Table 2.2 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to Kerb of Nearest Road (m)	Tube Co-located with a Continuous Analyser	Height (m)
CH1	38 Larkfield Park Chepstow	Roadside	352800	193274	NO2	Chepstow	0.2	10.0	No	1.6
CH2a	Lamppost No. WH70, Newport Road, Chepstow	Kerbside	352821	193307	NO2	Chepstow	3.7	1.8	No	2.5
CH3	36 Wayside - Hardwick Hill Chepstow	Roadside	352970	193452	NO2	Chepstow	0.2	12.0	No	1.7
CH4	2 Hardwick Hill - Chepstow	Roadside	353009	193444	NO2	Chepstow	0.6	4.0	No	3.1
CH5	1 Ashfield House - Mount Pleasant	Roadside	353141	193451	NO2	Chepstow	0.2	14.0	No	1.6
CH6	Hill House -Mount Pleasant Chepstow	Roadside	353166	193586	NO2	Chepstow	0.2	6.0	No	2.3
CH7	2 Hardwick Terrace - Chepstow	Roadside	353164	193663	NO2	Chepstow	0.2	1.5	No	2.6
CH8	Moor Street Lamppost- Chepstow	Roadside	353219	193730	NO2	Chepstow	0.5	1.7	No	2.8
CH9	Restway Wall - Garden City Way	Roadside	353306	193681	NO2	No	0.2	11.0	No	1.9
AQ1, AQ2, AQ3	AQMS - Hardwick Hill Chepstow 3	Roadside	353125	193472	NO2	Chepstow	20.0	4.0	Yes	2.9
PWLL1	Lamppost NY237 - 1 The Chestnuts, Pwllmeyric	Kerbside	351983	192594	NO2	No	16.0	1.2	No	2.4
PWLL2	Lamppost NY241 - The Cedars, Pwllmeyric	Kerbside	351873	192489	NO2	No	1.9	1.9	No	2.4
PWLL3	Lamppost NY246 - Hill House, Pwllmeyric	Kerbside	351724	192370	NO2	No	6.2	1.4	No	2.4
PWLL4	2 White Cottage, Pwllmeyric	Roadside	351666	192300	NO2	No	0.1	2.2	No	2.4
MM1	School House - Wyebridge St Monmouth	Roadside	351072	212821	NO2	No	0.2	3.4	No	2.7
MM2	Flat 1 - Granville St Monmouth	Roadside	351139	212894	NO2	No	0.2	25.0	No	2.7
MM3	Lamppost ME 145 - 21 St James Sq. Monmouth	Roadside	351085	212930	NO2	No	2.4	0.5	No	2.3
MM4	12A Monnow Street on St Johns Street, Monmouth	Roadside	350718	212794	NO2	No	0.2	0.7	No	2.3
MM7	Arka, Old Dixton Road, Monmouth	Roadside	351197	212980	NO2	No	0.1	23.0	No	2.3

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to Kerb of Nearest Road (m)	Tube Co-located with a Continuous Analyser	Height (m)
MM9	1, The Shrubbery, Old Dixton Road, Monmouth	Roadside	351467	213280	NO2	No	0.2	16.0	No	2.3
MM11	Fence of Boys School Playground	Roadside	351024	212652	NO2	No	0.5	4.8	No	3.0
MM13	Pike House, New Dixton Road, Monmouth	Roadside	351884	213660	NO2	No	0.2	6.5	No	1.6
MM15	6 Monnow Street/Fancy Fred's, Monmouth	Roadside	350729	212811	NO2	No	0.2	1.5	No	2.3
MM16	Lamppost ME380 Adj 20A Monnow Street, Monmouth	Roadside	350695	212775	NO2	No	1.4	2.1	No	2.3
MM17	4 Agincourt Square - The Punch House	Roadside	350779	212868	NO2	No	0.5	1.7	No	2.5
MM18	Monmouth School D&T Block	Roadside	351091	212791	NO2	No	0.2	13.0	No	2.1
MM19	Lamp post, 7 Ty Mawr, Monk Street, Monmouth	Roadside	350953	213098	NO2	No	1.5	1.8	No	2.5
MM21	Lamp post ME399, 14 Victoria Place, Priory Street, Monmouth	Roadside	350910	213071	NO2	No	0.3	1.5	No	2.5
AB1	Lamppost MC178- Merthyr Rd, Abergavenny	Roadside	329170	213867	NO2	No	0.4	0.9	No	2.4
AB2	Back Clinic, 2a Bridge Cottages, Merthyr Rd Aber	Roadside	329202	213822	NO2	No	0.2	1.7	No	2.5
AB3	112 Merthyr Road, Abergavenny	Roadside	329324	214080	NO2	No	0.3	1.8	No	2.5
AB4	L/P Adj. 5 Coopers Way, Merthyr Rd, Abergavenny	Roadside	329275	213686	NO2	No	2.4	1.6	No	2.4
AB5	1 Usk View, Merthyr Rd, Abergavenny	Roadside	329212	214075	NO2	No	0.1	5.0	No	1.9
AB7	Lamp post WB259 - 14 Pen-y-fal Road, Abergavenny, NP7 5UB	Roadside	329848	214556	NO2	No	6.1	1.6	No	2.3
AB8	4 Northgate, Abergavenny, NP7 5TT	Roadside	329837	214547	NO2	No	0.3	3.5	No	1.8
AB9	8 Brecon Road, Abergavenny, NP7 5UG	Roadside	329523	214512	NO2	No	0.3Lim	2.5	No	1.8
USK1	14A Castle Parade - Usk	Roadside	337860	201039	NO2	No	0.2	1.6	No	2.3
USK2	Castle Court - Usk	Roadside	337710	200936	NO2	Usk	0.2	1.4	No	2.5
USK3	White Hart - 5 Bridge St Usk	Roadside	337663	200906	NO2	Usk	0.2	1.3	No	2.4

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to Kerb of Nearest Road (m)	Tube Co-located with a Continuous Analyser	Height (m)
USK4	35 Bridge St - Usk	Roadside	337596	200849	NO2	Usk	0.2	1.3	No	2.5
USK5	16 Bridge St -Lamp Post MA 556 - Usk	Roadside	337562	200824	NO2	Usk	0.5	1.2	No	2.4
USK6	4 Usk Bridge Mews - Usk	Roadside	337473	200755	NO2	Usk	0.2	4.9	No	2.6
WS1	13 Woodside, Usk	Roadside	337363	200707	NO2	No	0.2	1.0	No	2.5
WS2	19 Woodside, Usk	Roadside	337356	200736	NO2	No	0.2	2.7	No	1.8
WS3	22 Woodside, Usk	Roadside	337364	200749	NO2	No	0.0	1.5	No	2.5

**Notes:**

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



Figure 2.2 – Maps of Non-Automatic Monitoring Sites

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)

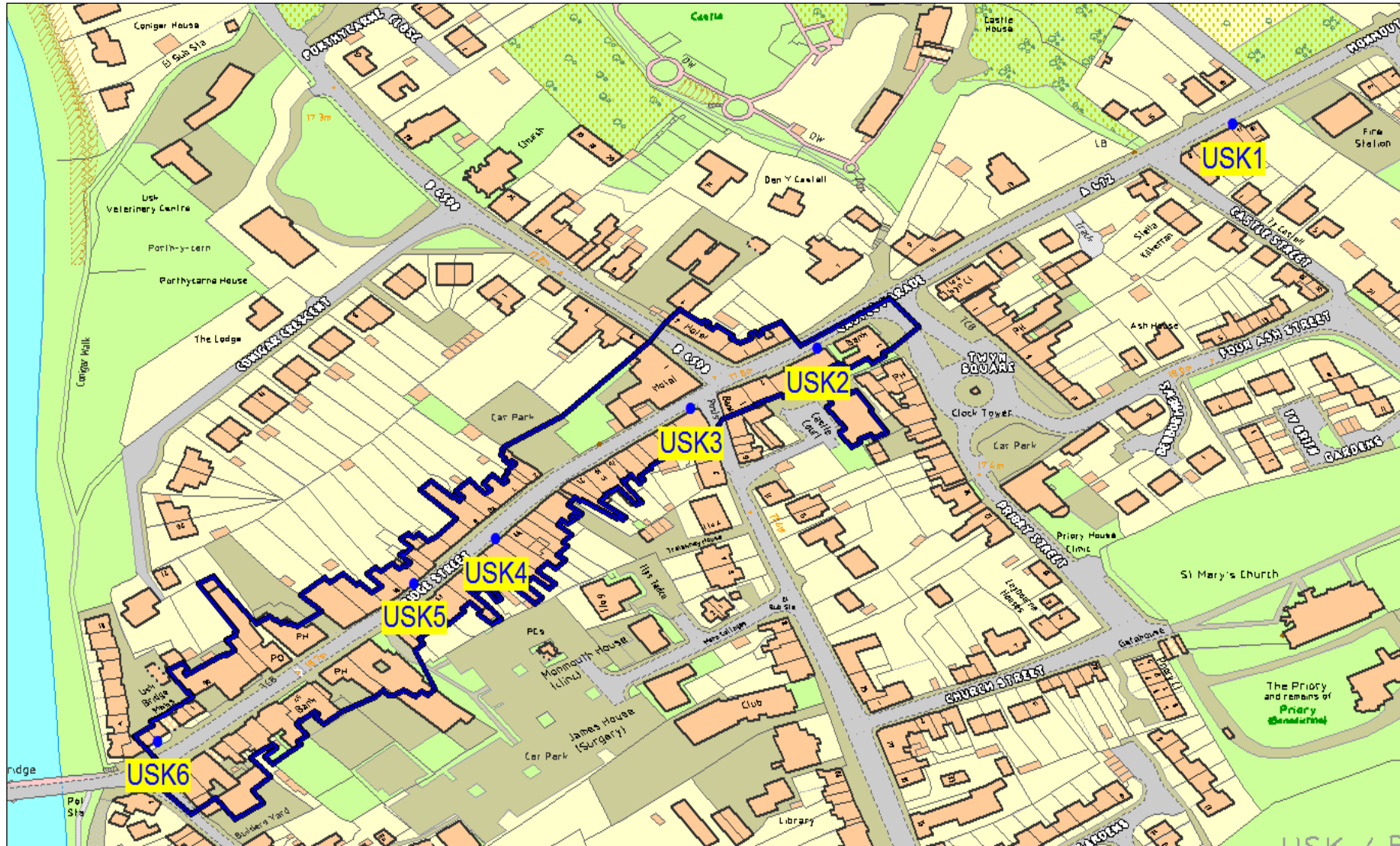




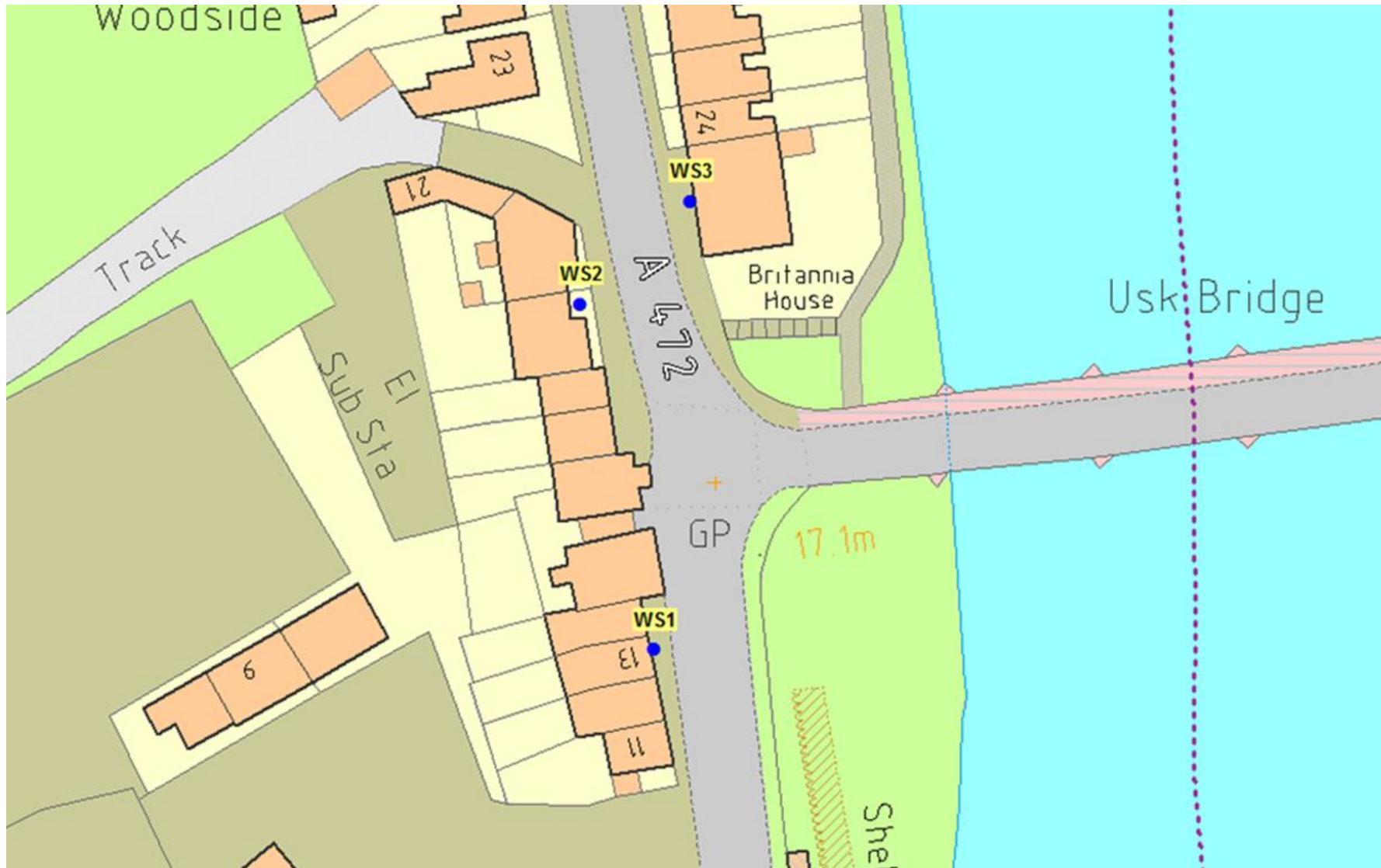
### Nitrogen Dioxide Monitoring Locations – Pwllmeyric



Nitrogen Dioxide Monitoring Locations - Usk AQMA (blue line is boundary of AQMA)



Nitrogen Dioxide Monitoring Locations – Woodside, Usk

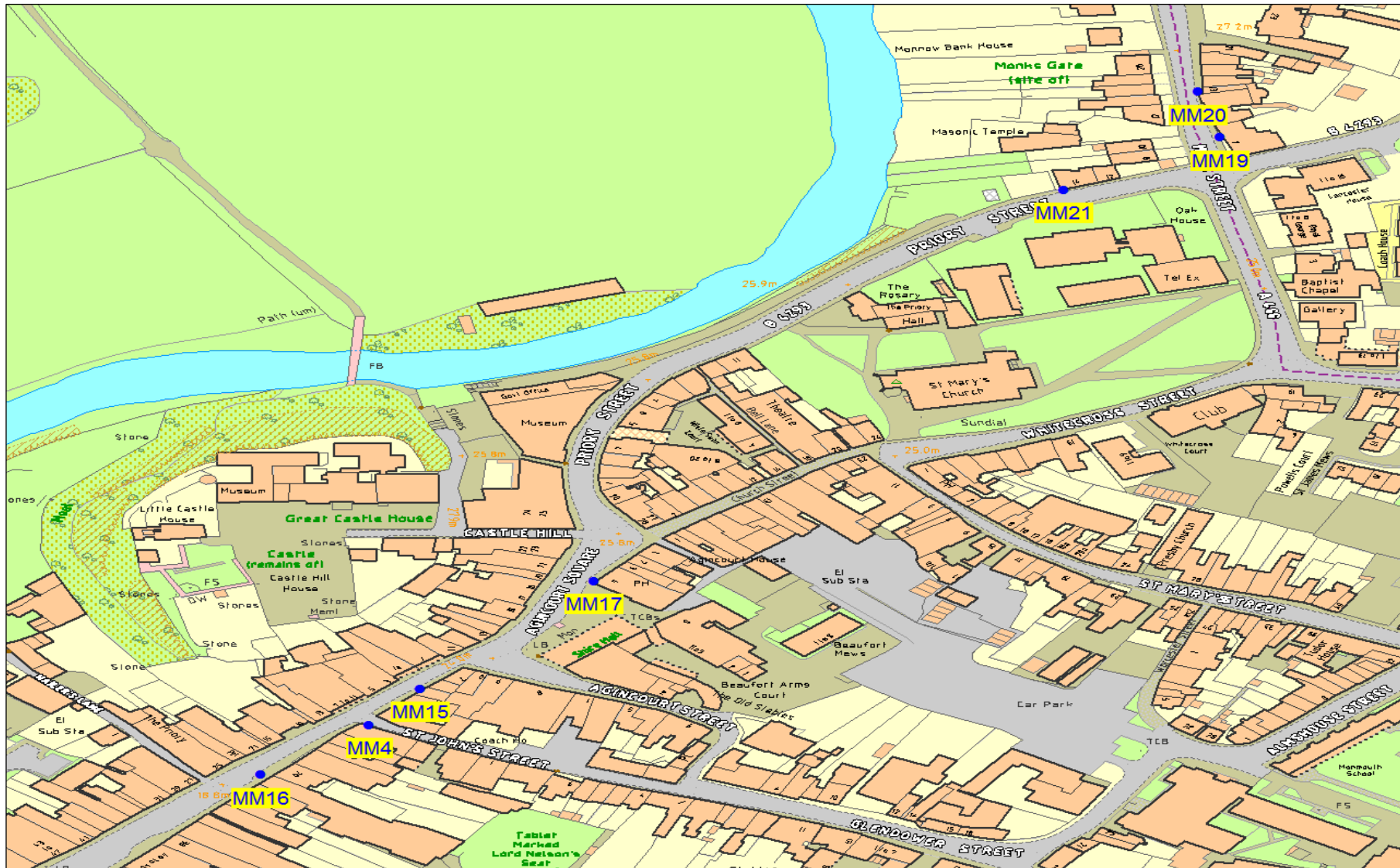




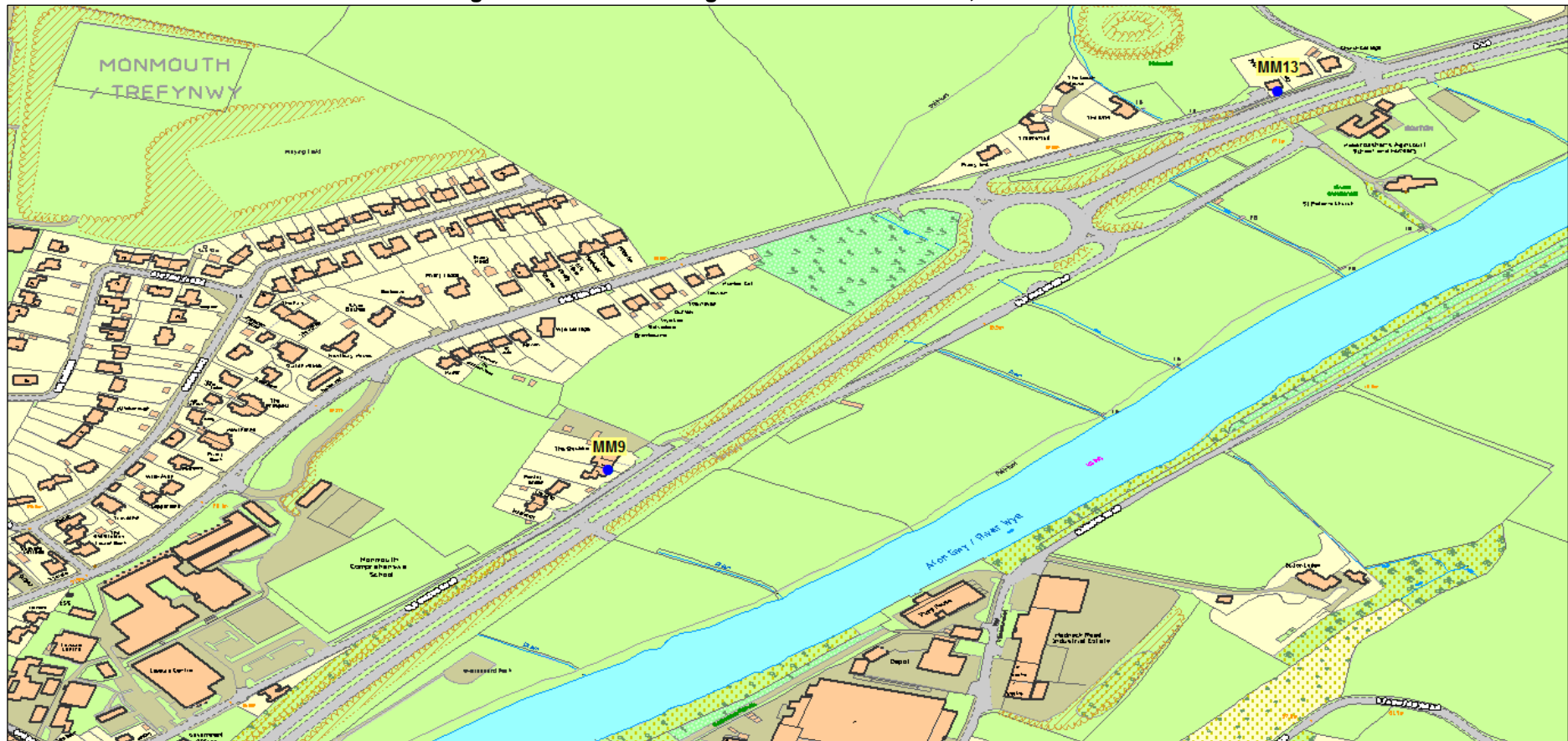
Nitrogen Dioxide Monitoring Locations – Monmouth, A40/Wyebridge Street



Nitrogen Dioxide Monitoring Locations – Monmouth, Monnow Street & Monk Street/Priory Street junction

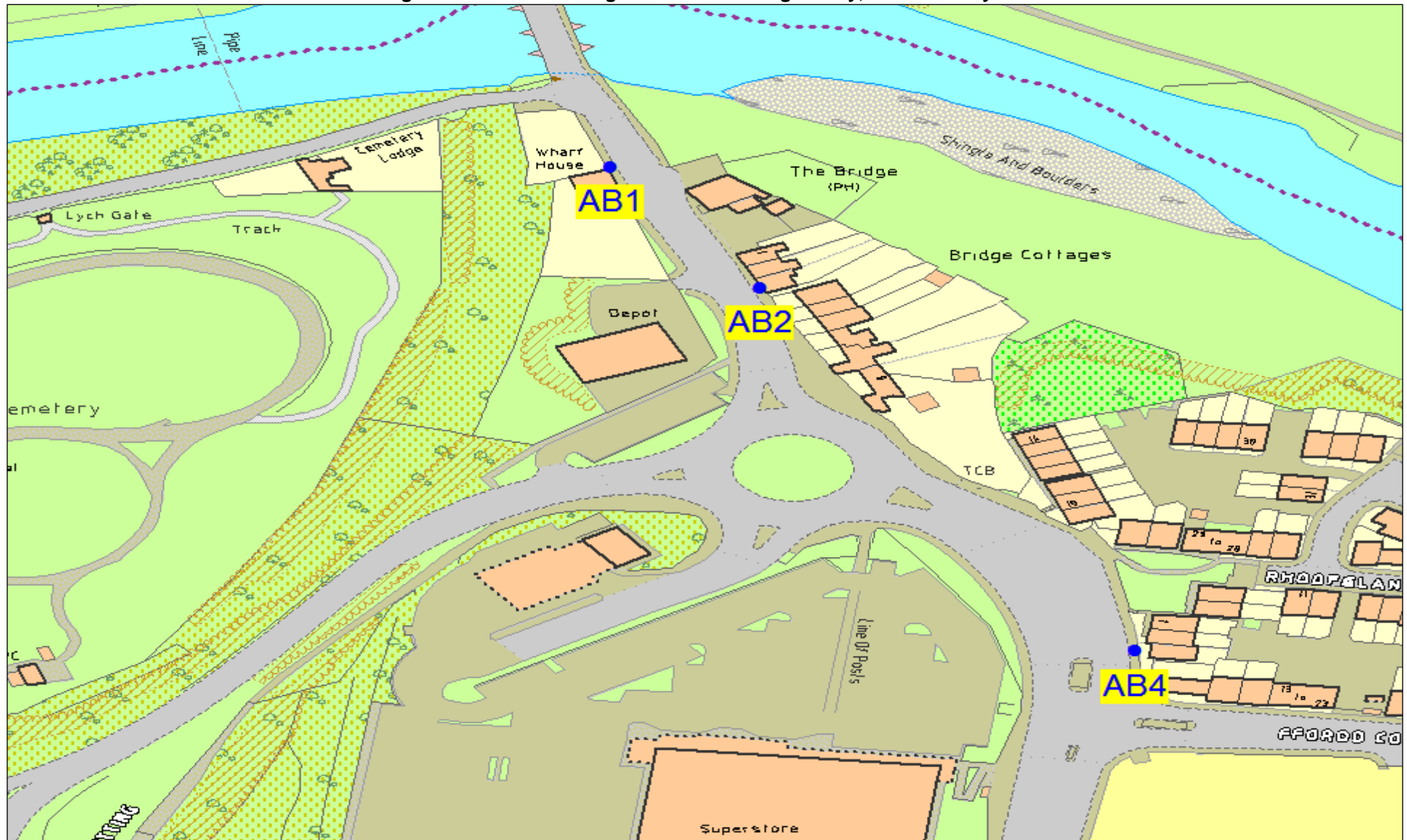


Nitrogen Dioxide Monitoring Locations – Monmouth, Old Dixton Road

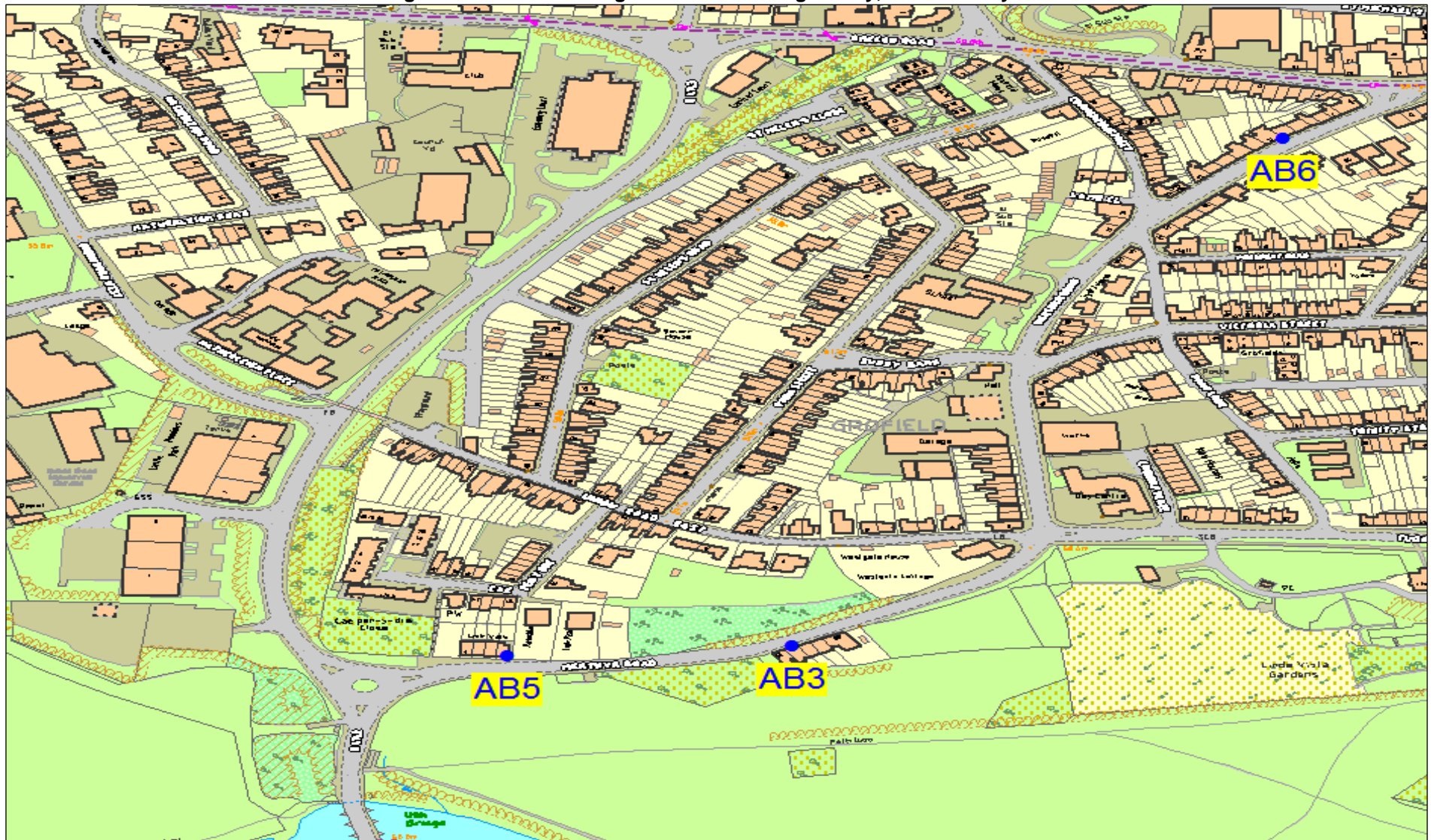




Nitrogen Dioxide Monitoring Locations – Abergavenny, South Merthyr Road

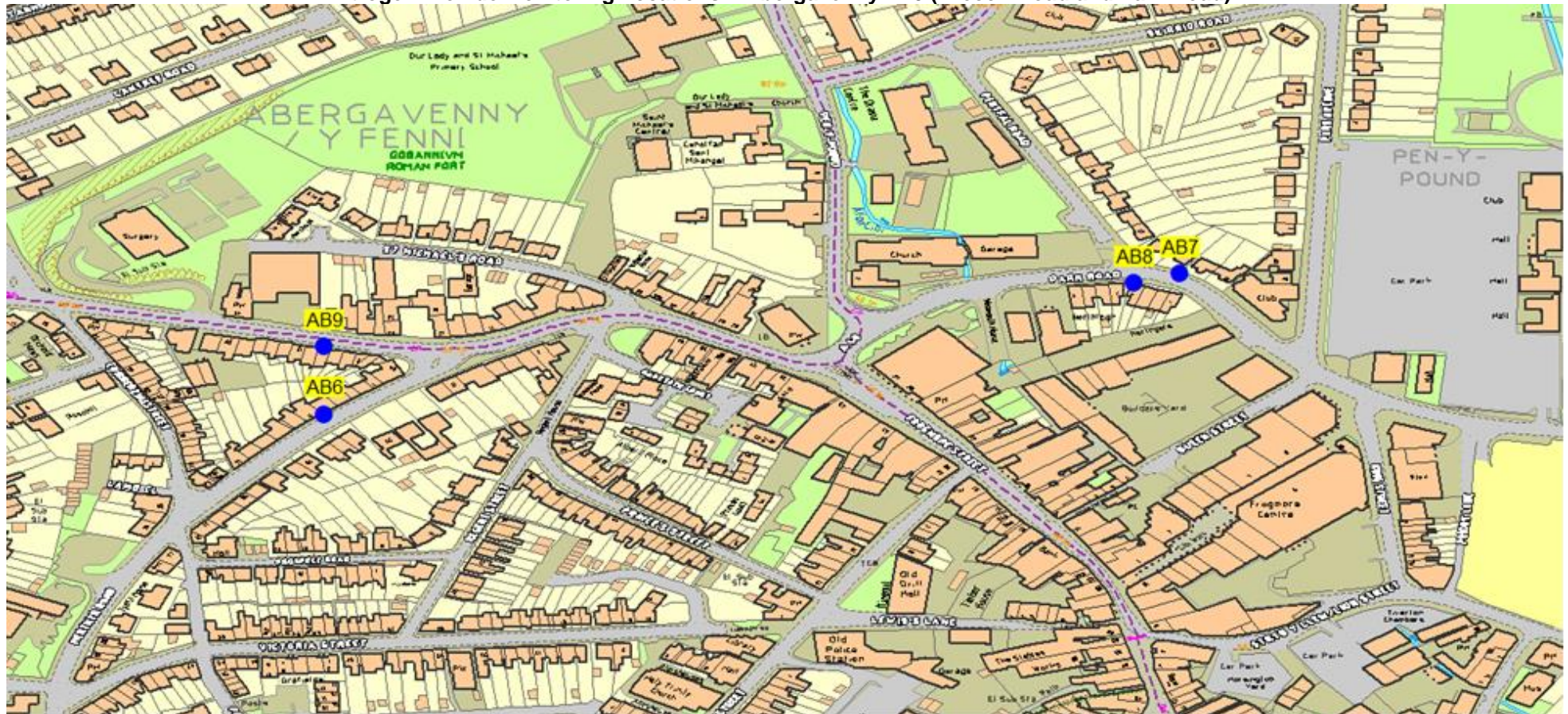


Nitrogen Dioxide Monitoring Locations – Abergavenny, North Merthyr Road





Nitrogen Dioxide Monitoring Locations – Abergavenny A40 (Brecon Road and Park Road)



\*AB6 was removed and AB9 was installed January 2020\*

## 2.2 2022 Air Quality Monitoring Results

Table 2.3 – Annual Mean NO<sub>2</sub> Monitoring Results (µg/m<sup>3</sup>) 2007 - 2022

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	NO <sub>2</sub> Annual Mean Concentration (µg/m <sup>3</sup> )															
					2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<b>Annual Bias Adjustment Factor (diffusion tubes only)</b>					0.84	0.85	0.84	0.88	0.89	0.94	0.95	0.91	0.91	0.92	0.87	0.92	0.93	0.77	0.84	0.83
AQMS	Roadside	Automatic Chemiluminescence	98	98	36.9	41.9	38.0	39.0	40.0	39.1	34.5	38.6	37	35	35	36	39	26	29	28
CH1	Roadside	Diffusion Tube	100	100	20.0	24.0	21.0	23.5	22.6	25.3	22.4	21.8	22.5	22.9	22.2	19.1	20.1	13.6	15.6	14.9
CH2a <sup>(3)</sup>	Roadside	Diffusion Tube	100	100	28.0	33.0	30.0	31.0	30.7	32.0	30.4	33.1	30.9	31.0	27.9	27.8	28.4	22.6	27.9	27.3
CH3	Roadside	Diffusion Tube	100	100	27.0	31.0	27.0	28.7	32.8	35.5	32.7	32.5	29.8	31.1	29.9	26.5	28.8	20.4	23.4	22.5
CH4	Roadside/	Diffusion Tube	100	100	<b>49.0</b>	<b>57.0</b>	<b>54.0</b>	<b>51.5</b>	<b>60.1</b>	<b>60.3</b>	<b>56.0</b>	<b>57.7</b>	<b>51.4</b>	<b>53.2</b>	<b>51.1</b>	<b>42.5</b>	<b>42.3</b>	31.6	36.0	33.9
CH5	Roadside	Diffusion Tube	100	100	29.0	32.0	30.0	30.3	30.4	33.2	28.4	26.1	25.9	26.7	26.8	23.5	26.0	19.1	19.0	19.3
CH6	Roadside	Diffusion Tube	100	100	37.0	<b>41.0</b>	36.0	39.2	40.7	<b>42.6</b>	<b>41.7</b>	<b>40.0</b>	36.8	37.6	37.1	34.3	34.7	27.4	28.2	26.3
CH7	Roadside	Diffusion Tube	100	100	29.0	32.0	30.0	31.5	30.4	33.7	30.6	28.4	26.9	27.9	25.9	25.1	25.5	18.1	22.0	21.0
CH8	Kerbside/ Urban Centre	Diffusion Tube	100	100	28.0	33.0	32.0	32.5	32.9	35.5	31.1	31.8	28.1	27.7	27.1	26.4	26.3	18.3	21.0	20.9
CH9	Roadside	Diffusion Tube	100	100	25.0	29.0	28.0	28.7	30.5	30.7	28.1	27.8	25.5	27.2	26.8	23.6	24.2	17.4	20.5	20.4
PWLL1 <sup>(3)</sup>	Roadside	Diffusion Tube	100	100													25.5	32.0	35.8	33.0
PWLL2 <sup>(3)</sup>	Roadside	Diffusion Tube	100	100													26.5	19.9	23.8	22.8
PWLL3 <sup>(3)</sup>	Roadside	Diffusion Tube	92	92													29.9	30.6	32.9	33.0
PWLL4	Roadside	Diffusion Tube	92	92													21	14.0	16.4	15.5

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	NO <sub>2</sub> Annual Mean Concentration (µg/m <sup>3</sup> )															
					2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<b>Annual Bias Adjustment Factor (diffusion tubes only)</b>					0.84	0.85	0.84	0.88	0.89	0.94	0.95	0.91	0.91	0.92	0.87	0.92	0.93	0.77	0.84	0.83
MM1	Roadside	Diffusion Tube	92	92	39.0	38.5	37.3	36.6	36.9	39.0	34.1	34.9	32.8	33.1	33.9	31.6	30.4	22.9	24.9	24.9
MM2	Intermediate	Diffusion Tube	92	92	31.0	31.7	30.0	31.3	31.7	30.2	29.9	30.0	26.1	26.5	26.9	25.7	23.5	15.6	18.7	18.6
MM3	Kerbside	Diffusion Tube	100	100	30.0	27.8	27.6	30.0	29.8	27.7	26.3	26.3	22.9	23.4	23.9	22.5	21.2	15.2	16.7	17.3
MM4	Kerbside/ Urban Centre	Diffusion Tube	100	100	38.0	37.1	34.6	36.1	34.9	36.7	35.7	29.8	26.0	26.4	25.2	24.1	24.8	15.1	16.9	18.9
MM7	Intermediate	Diffusion Tube	100	100								27.4	24.3	25.3	23.8	22.9	21.5	14.3	17.1	18.1
MM9	Intermediate	Diffusion Tube	100	100								24.7	21.8	23.2	21.5	20.5	18.7	15.0	14.8	14.7
MM11	Roadside	Diffusion Tube	92	92								31.6	26.4	30.2	27.0	29.0	24.6	17.6	22.4	21.4
MM13	Roadside	Diffusion Tube	67	67								35.2	32.5	32.1	35.1	32.5	30.0	20.6	22.3	25.4
MM15	Roadside/ Urban Centre	Diffusion Tube	100	100								32.9	33.1	33.7	32.3	31.8	30.7	17.4	23.3	23.1
MM16	Roadside/ Urban Centre	Diffusion Tube	83	83								24.7	30.0	30.6	27.9	26.6	26.5	15.1	18.9	20.0
MM17	Roadside/ Urban Centre	Diffusion Tube	92	92									22.6	24.5	22.7	21.6	21.6	12.2	15.3	15.0
MM18	Roadside	Diffusion Tube	100	100									26.7	28.1	28.7	25.9	24.1	15.8	19.5	19.4
MM19	Roadside	Diffusion Tube	100	100									29.3	31.2	28.2	30.0	27.6	17.0	21.3	21.1
MM21	Roadside	Diffusion Tube	75	75									32.1	34.6	32.6	32.2	29.8	15.9	22.0	21.7
AB1 <sup>(3)</sup>	Kerbside	Diffusion Tube	100	100	34.0	36.5	36.0	38.6	39.4	<b>41.4</b>	37.5	39.3	36.1	38.4	38.0	36.9	35.4	27.3	29.8	31.3
AB2	Roadside	Diffusion Tube	100	100						<b>43.9</b>	36.7	39.1	34.4	35.0	32.7	33.8	31.4	21.7	25.5	25.3
AB3	Roadside	Diffusion Tube	100	100						36.8	30.0	29.0	26.1	26.8	25.4	28.5	27.5	17.0	20.6	20.2

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	NO <sub>2</sub> Annual Mean Concentration (µg/m <sup>3</sup> )																
					2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
<b>Annual Bias Adjustment Factor (diffusion tubes only)</b>					0.84	0.85	0.84	0.88	0.89	0.94	0.95	0.91	0.91	0.92	0.87	0.92	0.93	0.77	0.84	0.83	
AB4	Roadside	Diffusion Tube	83	83							27.6	27.8	26.5	26.4	25.5	27.6	25.0	18.5	20.7	21.2	
AB5	Roadside	Diffusion Tube	100	100							21.4	19.8	17.2	19.4	18.6	19.0	17.9	11.6	13.6	14.0	
AB7	Kerbside	Diffusion Tube	100	100													22.6	17.2	17.1	17.4	
AB8	Roadside	Diffusion Tube	100	100													20.1	13.5	16.9	16.9	
AB9	Roadside	Diffusion Tube	100	100														24.3	26.3	25.5	
USK1	Roadside	Diffusion Tube	92	92	33.0	32.8	31.1	34.9	32.9	33.0	33.5	34.3	30.1	30.5	31.7	27.2	28.5	19.2	19.7	18.4	
USK2	Roadside/ Urban Centre	Diffusion Tube	100	100	37.0	37.2	34.4	<b>40.9</b>	37.0	38.3	37.2	37.3	34.1	34.4	34.7	31.3	31.4	23.5	24.6	24.2	
USK3	Roadside/ Urban Centre	Diffusion Tube	75	75	<b>40.0</b>	38.9	35.3	<b>40.6</b>	39.7	<b>41.9</b>	<b>40.3</b>	37.6	32.8	35.1	36.6	32.1	33.3	20.6	23.0	24.6	
USK4	Roadside/ Urban Centre	Diffusion Tube	100	100	39.0	39.0	35.4	<b>41.7</b>	<b>40.7</b>	<b>43.5</b>	<b>42.0</b>	<b>40.4</b>	34.1	35.2	35.1	30.4	31.3	19.6	22.0	22.8	
USK5	Roadside/ Urban Centre	Diffusion Tube	100	100	<b>49.0</b>	<b>45.6</b>	<b>41.9</b>	<b>45.0</b>	39.7	<b>44.6</b>	<b>43.1</b>	<b>40.9</b>	38.2	37.8	35.2	30.0	30.8	24.3	25.0	23.7	
USK6	Roadside/ Urban Centre	Diffusion Tube	100	100	24.0	21.6	20.9	25.6	20.7	22.6	22.2	20.6	19.2	20.8	20.8	19.6	19.3	14.2	15.5	13.9	
WS1	Kerbside	Diffusion Tube	100	100												25.8	23.8	23.5	16.3	18.0	17.8
WS2	Roadside	Diffusion Tube	100	100											29.6	27.1	27.8	18.5	19.7	20.4	
WS3	Roadside	Diffusion Tube	100	100											21.3	22.6	20.4	14.0	16.1	15.4	

**Notes:**

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

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective are shown in **bold and underlined**.

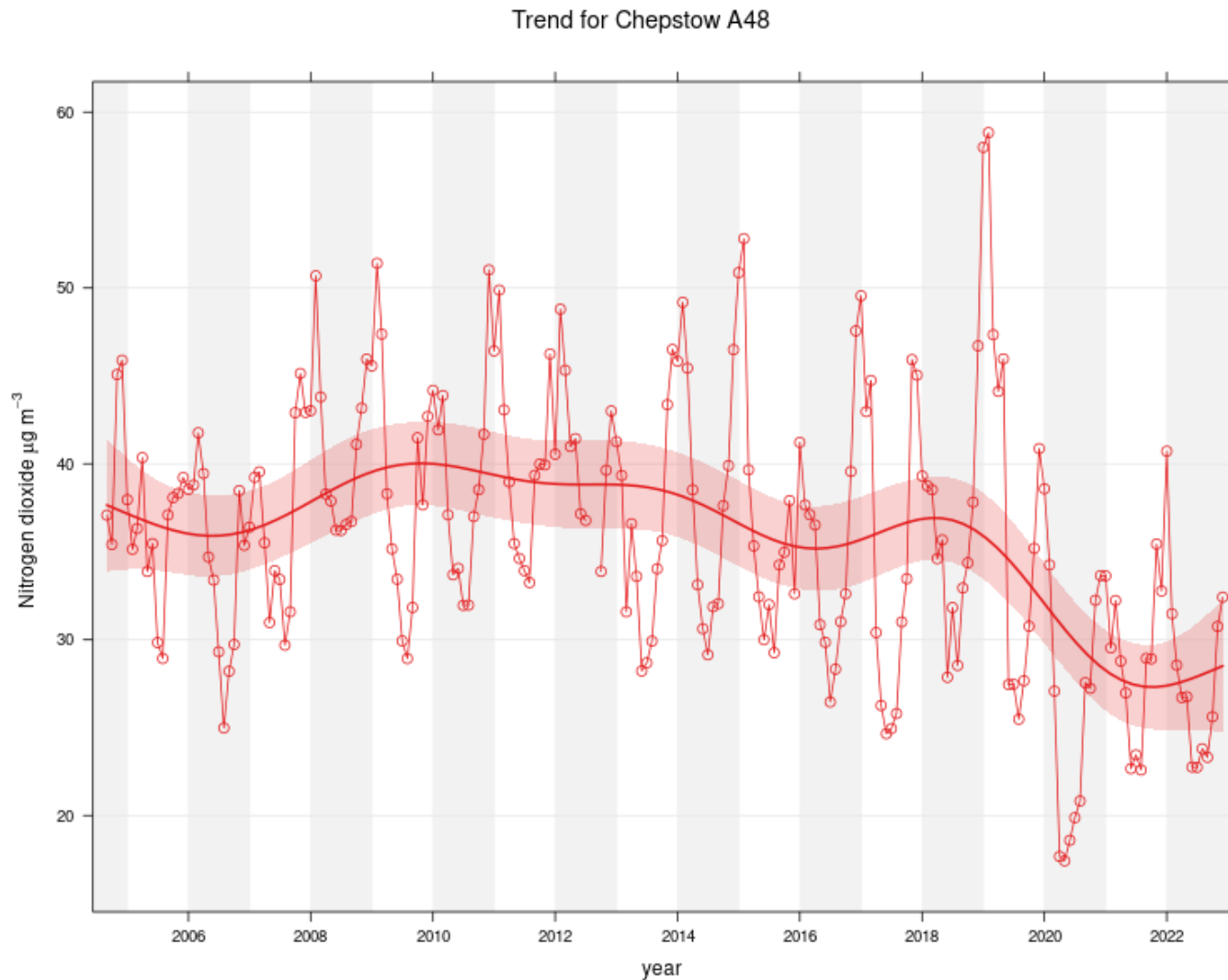
Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.



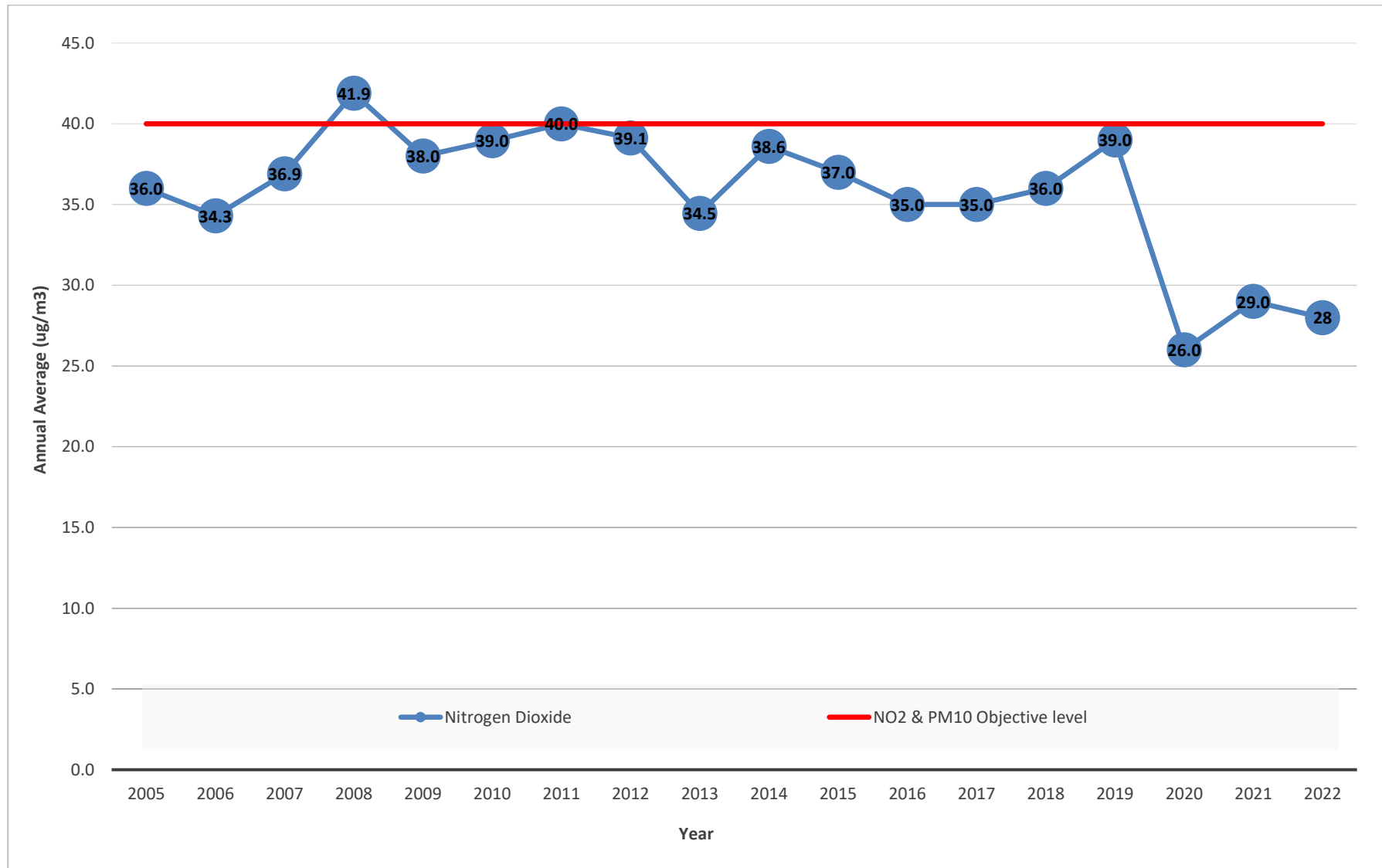
- (1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.  
In 2020 (due to COVID-19) the valid monitoring period is ten months - March – December 2020 for tubes analysed by SOCOTEC. January and February tubes were analysed by Gradko and were not used in the calculation of the annual mean, or calculation of the BAF
- (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) Prior to 2020 AB1, CH2a, PWLL1, PWLL2, PWLL3 were distance corrected to the nearest receptor. From 2020 onwards they are only distance corrected if the uncorrected value is within 10% of the objective level (i.e.,  $36\mu\text{g}/\text{m}^3$  or above). As such 2020 onwards concentrations for these locations could be higher than previous year's as they show the actual concentration at the tube/kerbside/roadside, rather than the concentration at the nearest receptor, unless their uncorrected concentration is above  $36\mu\text{g}/\text{m}^3$ .

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

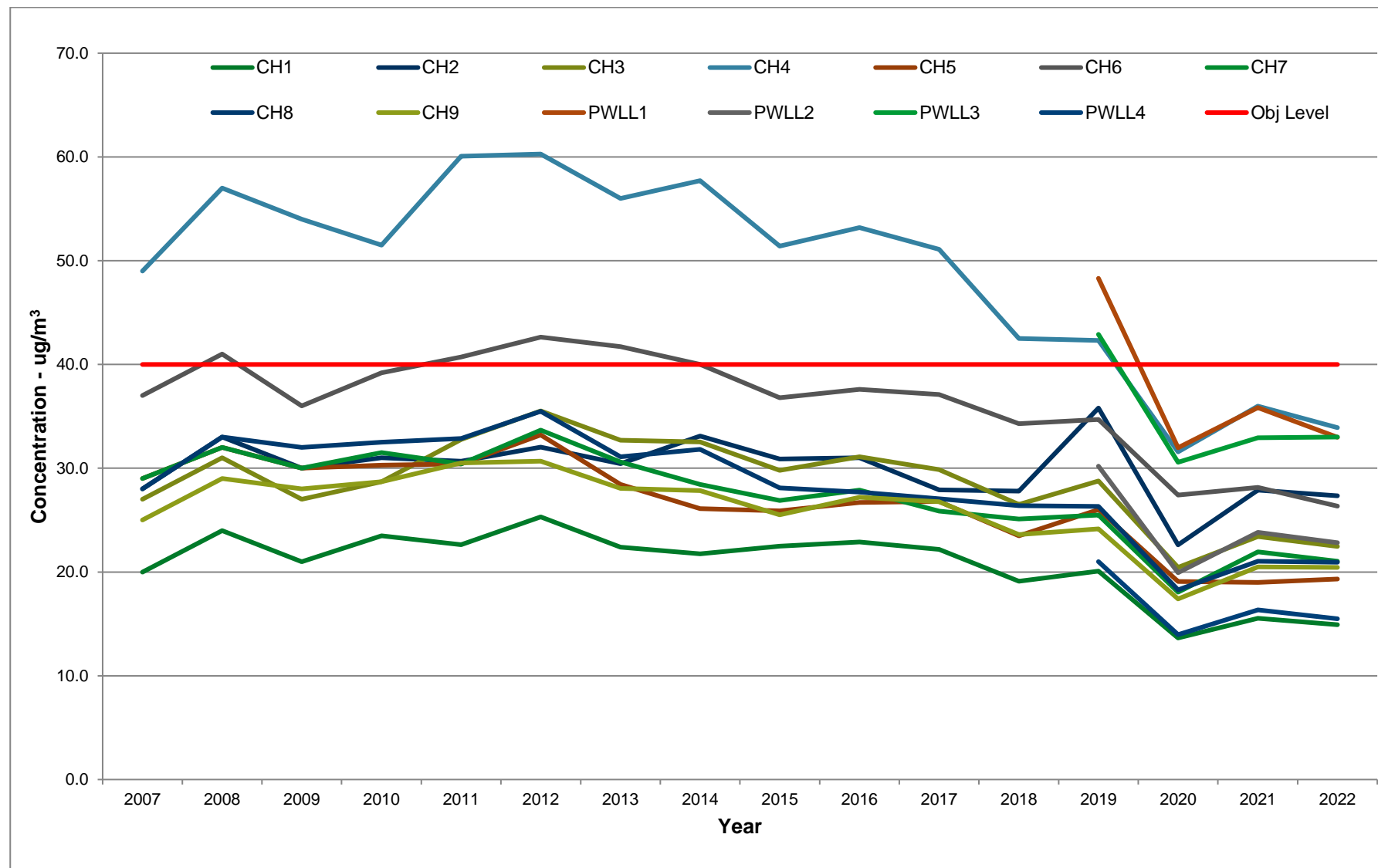
Automatic analyser – (AQMS) nitrogen dioxide monthly average with smoothed trend line 2005-2022



Automatic analyser – (AQMS) nitrogen dioxide annual mean 2005-2022

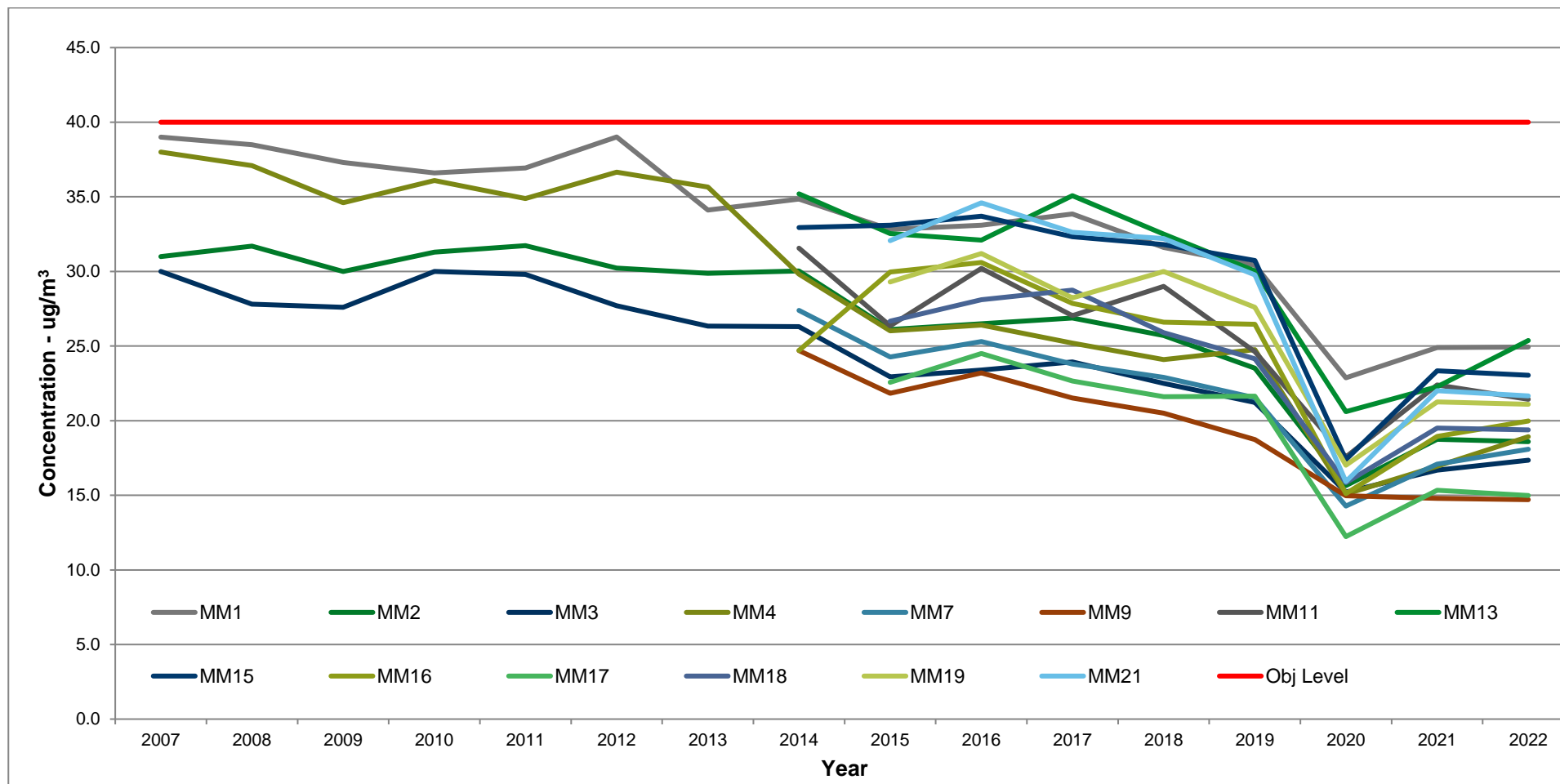


Diffusion Tubes trends (Chepstow & Pwllmeyric) – 2007-2022

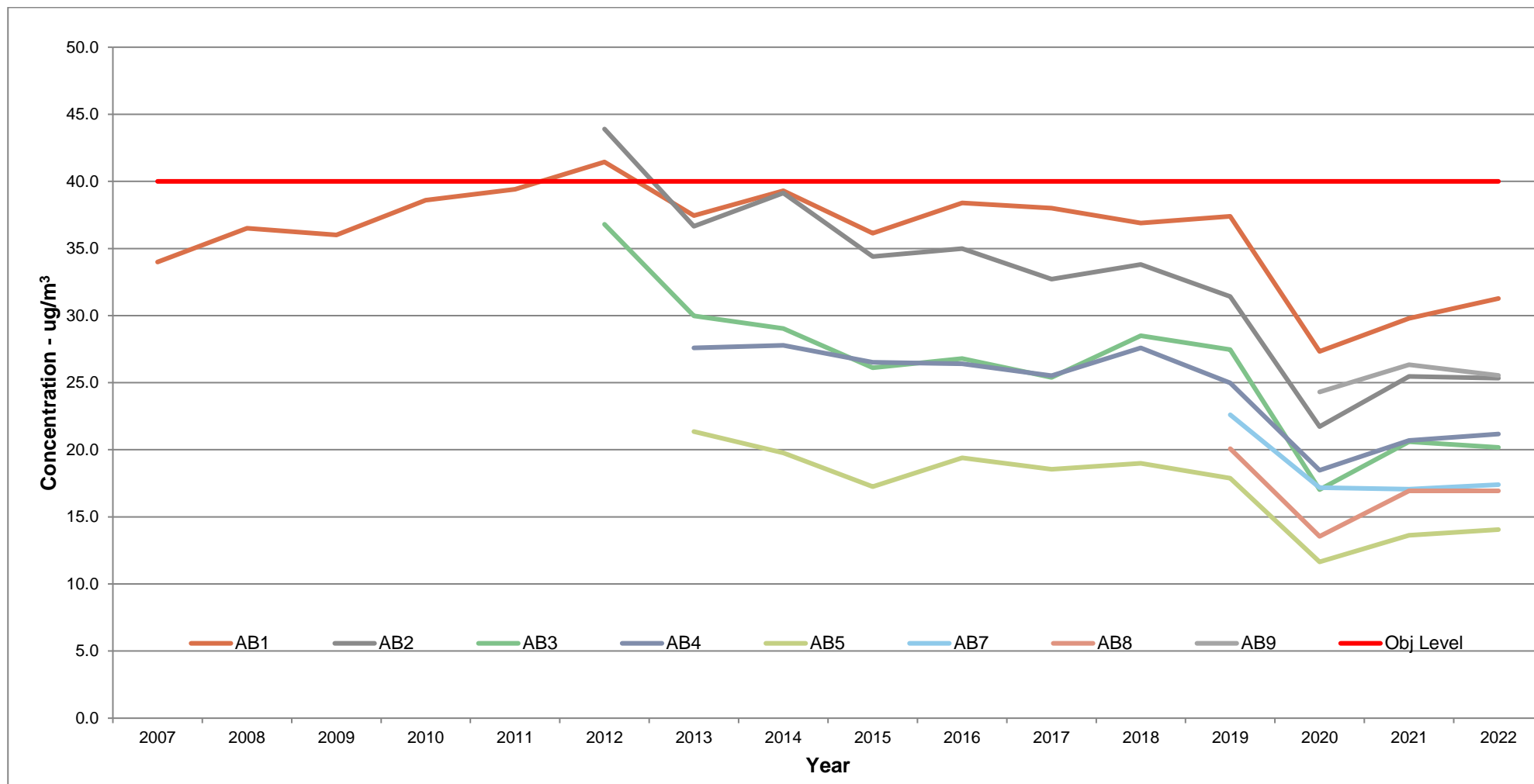




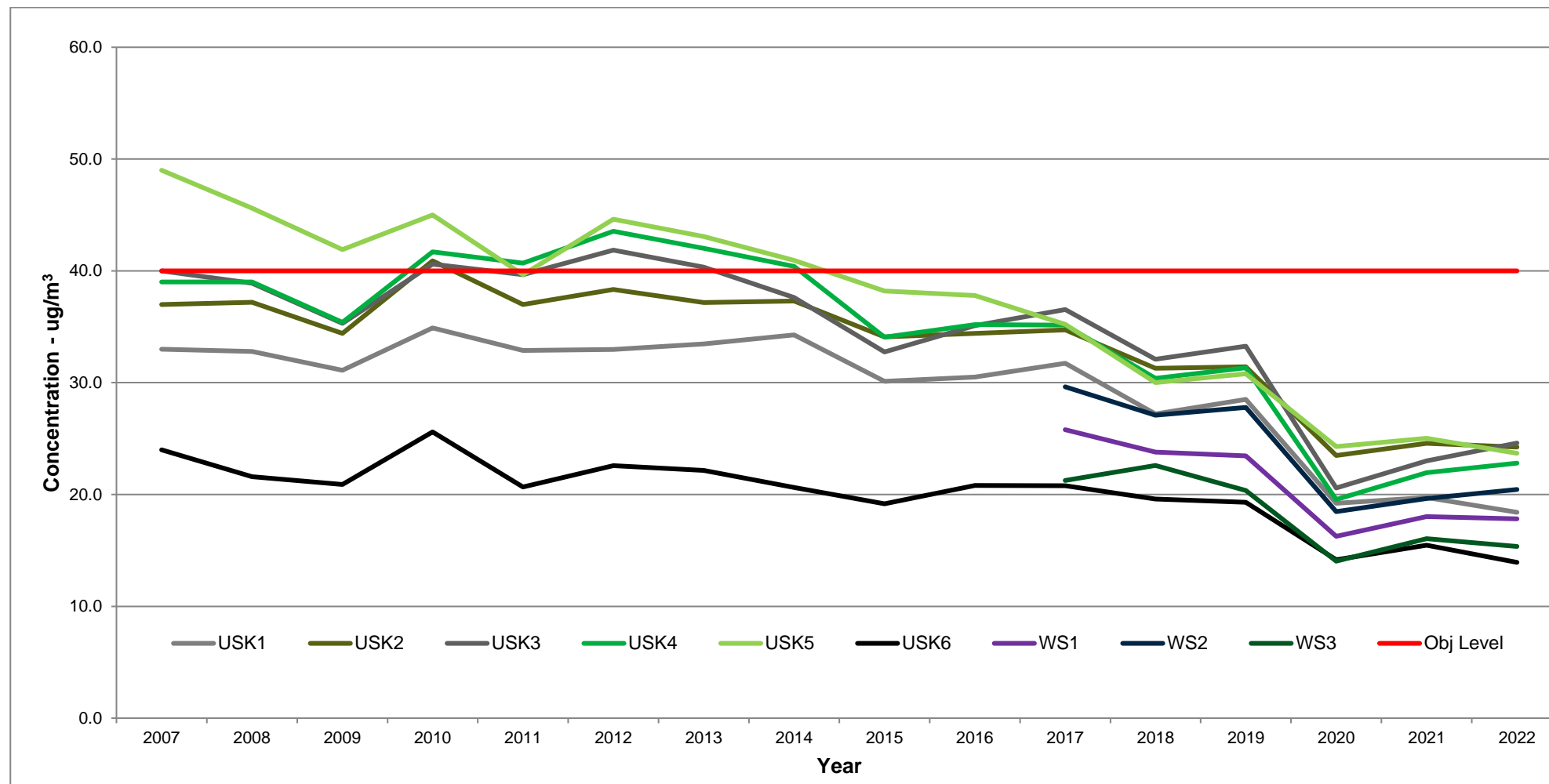
Diffusion Tubes trends (Monmouth) – 2007-2022



Diffusion Tubes trends (Abergavenny) – 2007-2022



Diffusion Tubes trends (Usk & Woodside) – 2007-2022



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

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	NO <sub>2</sub> 1-Hour Means > 200µg/m <sup>3</sup>									
					2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
AQMA	Roadside	Automatic Chemiluminescence	98	98	0	0	2	0	0	0	1	0	0	0
<b>1-hour mean objective</b>					<b>200µg/m<sup>3</sup> not to be exceeded more than 18 times/year</b>									

**Notes:**

Exceedances of the NO<sub>2</sub> 1-hour mean objective (200µg/m<sup>3</sup> not to be exceeded more than 18 times/year) are shown in **bold**.

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

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

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

**Table 2.5 – Annual Mean PM<sub>10</sub> Monitoring Results (µg/m<sup>3</sup>)**

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	PM <sub>10</sub> Annual Mean Concentration (µg/m <sup>3</sup> )									
					2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
AQMA	Roadside	Automatic BAM	96	96	19	18	17	18	16	18	20	17	16	18
<b>Annual mean objective</b>					<b>40µg/m<sup>3</sup></b>									

**Notes:**

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

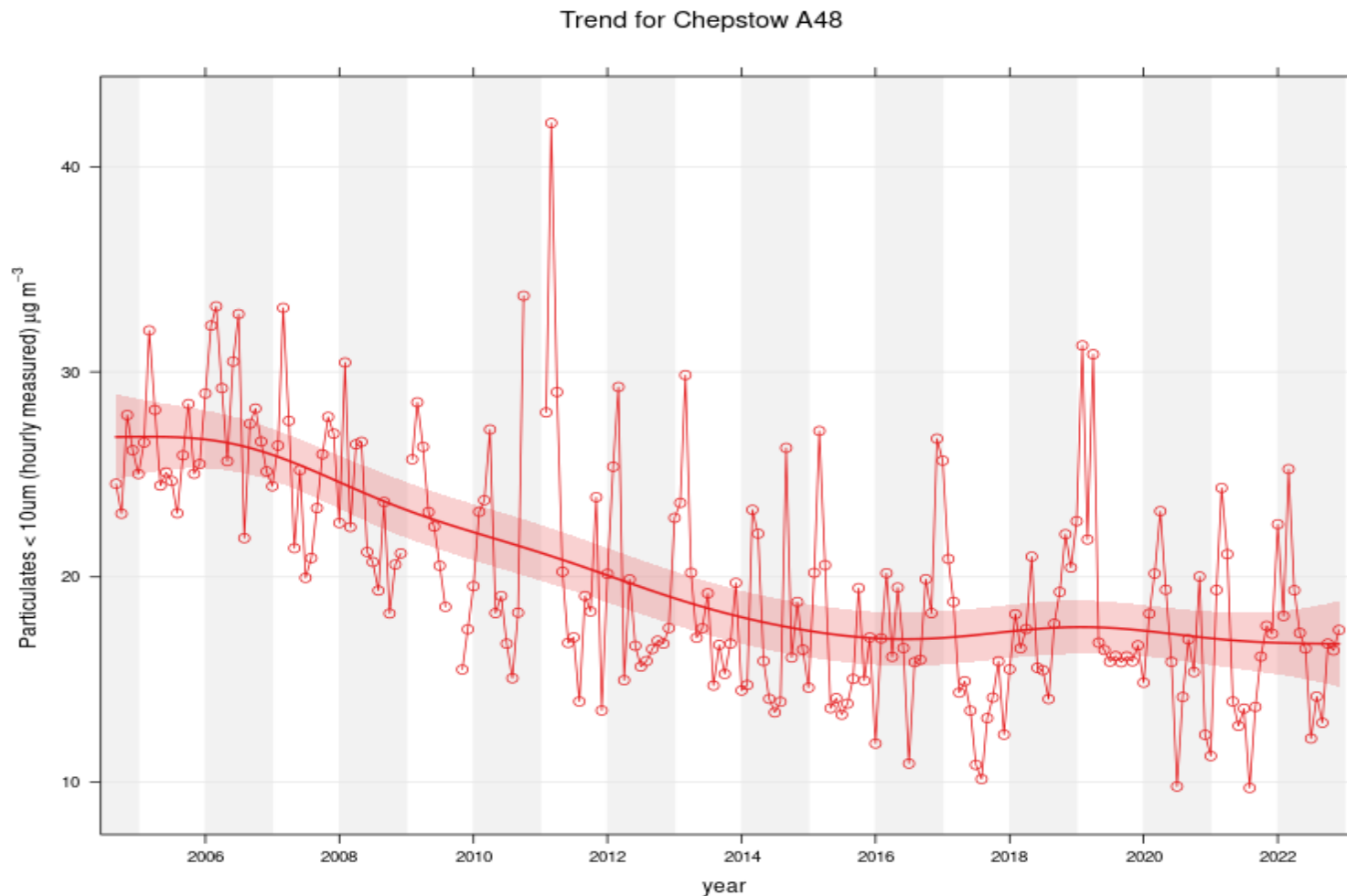
All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

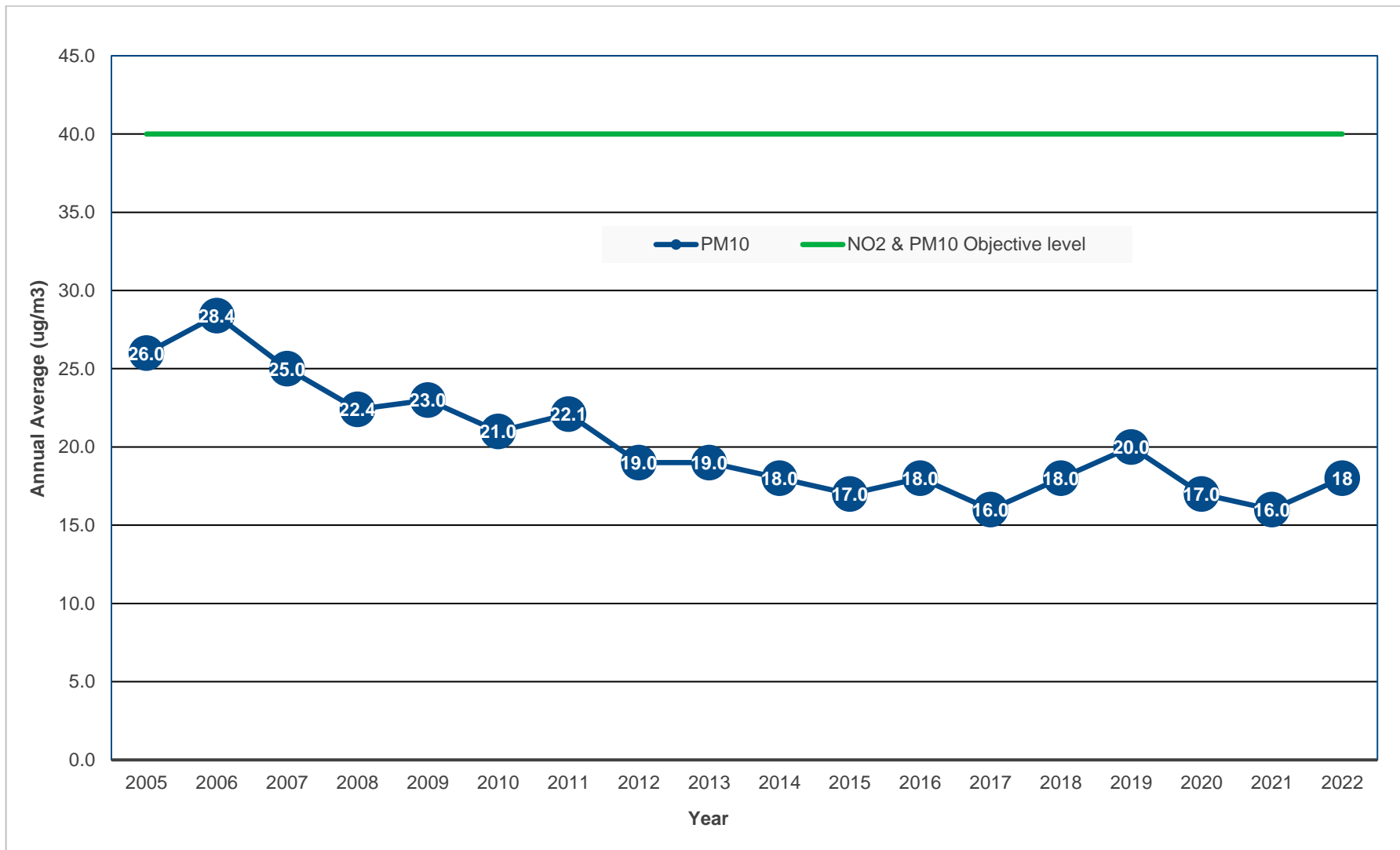
(2) Data capture for the full calendar year (e.g., if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

**Figure 2.4 – Trends in Annual Mean PM<sub>10</sub> Concentrations**

Automatic analyser – AQMS – PM<sub>10</sub> monthly average with smoothed trend line



Automatic analyser – (AQMS) PM<sub>10</sub> annual mean



**Table 2.6 – 24-Hour Mean PM<sub>10</sub> Monitoring Results, Number of PM<sub>10</sub> 24-Hour Means > 50µg/m<sup>3</sup>**

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2021 (%) <sup>(2)</sup>	PM <sub>10</sub> 24-Hour Means > 50µg/m <sup>3</sup>									
					2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
AQMA	Roadside	Automatic BAM	96	96	4	2	5	1	2	0	7	0	1	0
<b>24-hour mean objective</b>					<b>50µg/m<sup>3</sup> not to be exceeded more than 35 times/year</b>									

**Notes:**

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

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

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

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



**Table 2.7 – PM<sub>2.5</sub> Monitoring Results (µg/m<sup>3</sup>)**

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2019 (%) <sup>(2)</sup>	PM <sub>2.5</sub> Annual Mean Concentration (µg/m <sup>3</sup> )									
					2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
AQMA	Roadside	Automatic BAM	87	87	14	14	10	11	10	10	13	9	8	9
<b>Annual mean limit value</b>					<b>25µg/m<sup>3</sup></b>									

**Notes:**

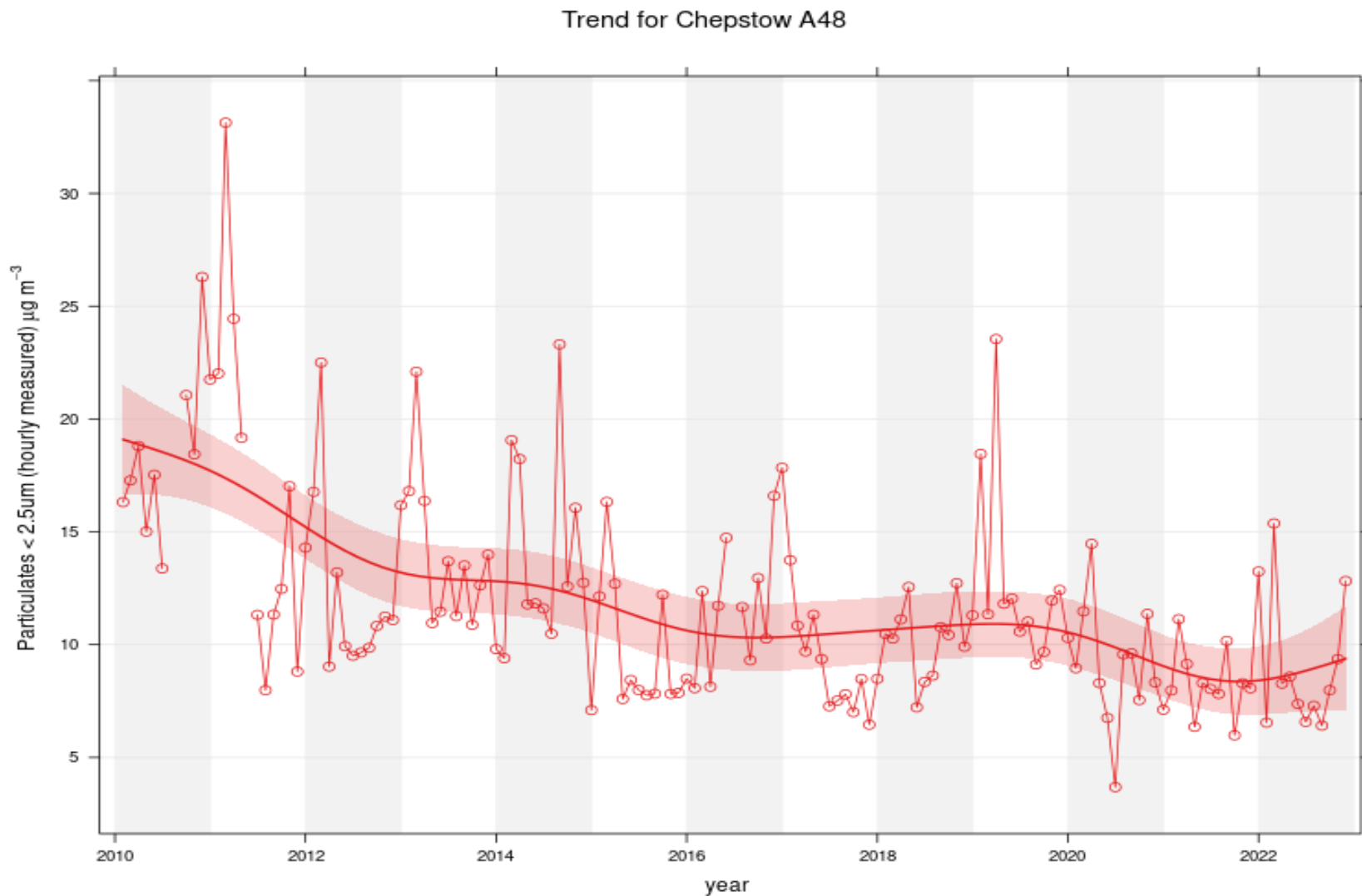
All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

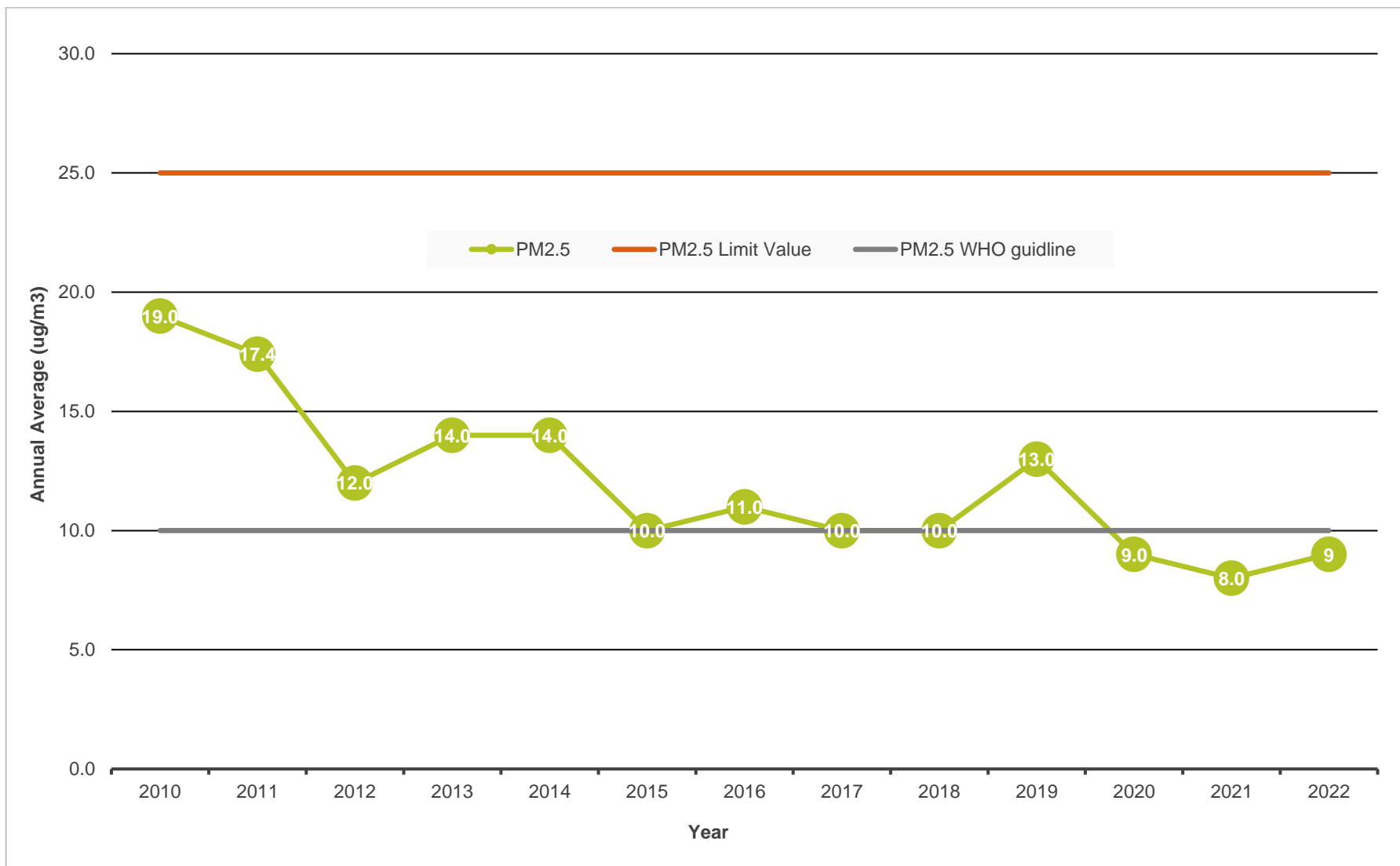
(2) Data capture for the full calendar year (e.g., if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

### Figure 2.5 – Trends in Annual Mean PM<sub>2.5</sub> Concentrations

Automatic analyser – AQMS – PM<sub>2.5</sub> monthly average with smoothed trend line



Automatic analyser – (AQMS) PM<sub>2.5</sub> annual mean



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

### Summary for Nitrogen Dioxide & Particulate Matter

In 2022 diffusion tube concentrations remained similar to 2021, the majority (twenty-eight tubes) showed small decreases of between 0.1-2.8 $\mu\text{g}/\text{m}^3$ , fourteen increased between 0.1 – 3.1 $\mu\text{g}/\text{m}^3$ , and 3 remained the same.

The automatic analyser nitrogen dioxide concentration decreased from 29 $\mu\text{g}/\text{m}^3$  to 28 $\mu\text{g}/\text{m}^3$ , whilst the highest daily mean of 69 $\mu\text{g}/\text{m}^3$  and the highest hourly mean of 130 $\mu\text{g}/\text{m}^3$  were almost identical to 2021 (69 $\mu\text{g}/\text{m}^3$  and 131 $\mu\text{g}/\text{m}^3$  respectively).

Since the 2020 pandemic concentrations have not returned to 2019 levels. Nitrogen dioxide concentrations in 2022 were generally the lowest to date (other than 2020), although the decrease over 2021 was too small to be significant. There has been a general decrease in nitrogen dioxide levels from 2012 to 2022.

In 2022 The PM<sub>10</sub> annual mean concentration increased from 2021 by 2 $\mu\text{g}/\text{m}^3$  (from 16 to 18 $\mu\text{g}/\text{m}^3$ ). The lowest recorded concentrations were in 2017 and 2021 at 16 $\mu\text{g}/\text{m}^3$ .

The highest daily mean in 2022 of 47 $\mu\text{g}/\text{m}^3$  was lower than 2021's 62 $\mu\text{g}/\text{m}^3$  however the highest hourly mean increased from 91 $\mu\text{g}/\text{m}^3$  in 2021 to 186  $\mu\text{g}/\text{m}^3$  in 2022.

Since 2012 PM<sub>10</sub> annual mean has not seen a trending decrease, as concentrations have remained between 16 and 20 $\mu\text{g}/\text{m}^3$ . Generally, there is one or two years decrease, followed by one- or two-years increase.

PM<sub>2.5</sub> increased by 1  $\mu\text{g}/\text{m}^3$  in 2022 compared to 2021 (9 $\mu\text{g}/\text{m}^3$ ). This returned it to the 2020 concentration.

PM<sub>2.5</sub> remained stable between 2015 and 2018 at 10-11  $\mu\text{g}/\text{m}^3$  but increase in 2019 to 13  $\mu\text{g}/\text{m}^3$ . It decreased in 2020 and decreased further in 2021 to 8  $\mu\text{g}/\text{m}^3$ . 2021 was the lowest recorded annual mean concentration.

### **Nitrogen Dioxide Short Term Objective Level**

The nitrogen dioxide short term objective level is a one hour mean of  $200\mu\text{g}/\text{m}^3$  not to be exceeded more than 18 times/year. In 2022 there were no 1-hour periods that exceeded  $200\mu\text{g}/\text{m}^3$  (the highest was  $130\mu\text{g}/\text{m}^3$ ). As such there was no breach of the objective level. The last time there was an exceedance of the 1-hour mean of  $200\mu\text{g}/\text{m}^3$  was in 2019, when there was one exceedance, and prior to that in 2015, when there were two 1-hour exceedances.

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

### **Nitrogen Dioxide Long Term Objective Level**

In 2022 there were no exceedances of the  $\text{NO}_2$  annual mean objective level of  $40\mu\text{g}/\text{m}^3$ . This was the third year where there were no exceedances in the county.

In 2019 there was one exceedance, and this was measured by diffusion tube. The exceedance occurred in the Chepstow AQMA (monitoring reference - CH4) which recorded  $42.3\mu\text{g}/\text{m}^3$ . In 2020 this same location recorded  $31.6\mu\text{g}/\text{m}^3$ , which is the lowest recorded concentration at this location, and the first year that the location has not exceeded the objective level. In 2021 the concentration increased to  $36\mu\text{g}/\text{m}^3$  which is still 10% lower than the objective level, and in 2022 it decreased to  $33.9\mu\text{g}/\text{m}^3$ .

CH4 has always recorded the highest concentration in the county at a relevant exposure (i.e., on a house) (in 2012 it reached  $60.3\mu\text{g}/\text{m}^3$ ) and remained the highest recorded relevant exposure location in 2022.

The only locations of similar concentration in 2022 were PWLL1 and PWLL3 which both recorded  $33.0\mu\text{g}/\text{m}^3$ , but these are roadside locations with the nearest houses 17 and 5.6 metres away. The fall off with distance calculation indicates that the concentration at the houses would be  $17.9\mu\text{g}/\text{m}^3$  and  $24.9\mu\text{g}/\text{m}^3$  respectively.

The automatic analyser in the AQMA on Hardwick Hill did not exceed the annual objective level and recorded an annual mean of  $29\mu\text{g}/\text{m}^3$  in 2021, and  $28\mu\text{g}/\text{m}^3$  in 2022. This is a  $11\mu\text{g}/\text{m}^3$  decrease from 2019 when it reached  $39\mu\text{g}/\text{m}^3$ , but a  $2\mu\text{g}/\text{m}^3$  increase from its lowest concentration of  $26\mu\text{g}/\text{m}^3$  in 2020. 2019 was the highest concentration since 2012, and a  $3\mu\text{g}/\text{m}^3$  increase over 2018.

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

### **Nitrogen Dioxide Summary for Usk & Woodside**

For the eight years in a row, there were no exceedances of the annual mean objective level in the Usk AQMA, and the fifth year below  $36\mu\text{g}/\text{m}^3$  (10% of the objective level).

Usk concentrations generally decreased between 2012 and 2015, remained stable until 2017, decreased in 2018, increased slightly in 2019 decreased significantly in 2020 due to the pandemic, and increased slightly in 2021, but remained well below 2019 concentrations (for example the highest location in 2021 was USK5 at  $25\mu\text{g}/\text{m}^3$  compared to 2019 when USK3 reached  $33\mu\text{g}/\text{m}^3$ ).

In 2022 concentrations remained stable with 6 locations decreasing slightly ( $0.3\text{-}1.5\mu\text{g}/\text{m}^3$  decreases) and 3 locations increasing slightly ( $0.8\text{-}1.6\mu\text{g}/\text{m}^3$  increases). The highest concentration in 2022 was USK3 at  $24.6\mu\text{g}/\text{m}^3$ . The lowest concentration in Usk in 2022 was USK 6 at  $13.9\mu\text{g}/\text{m}^3$ .

Historically the highest location in Usk was USK5 in 2007 at  $49\mu\text{g}/\text{m}^3$ , in 2022 it was  $23.7\mu\text{g}/\text{m}^3$ . USK5 and USK4 are located in the middle of Bridge Street at locations USK4 and USK5, which suffers from a canyon effect, and had a congestion problem from vehicles parked on double yellow lines and wait times for larger vehicles to cross the bridge. However, between 2017 and 2019 USK3 and USK2 recorded higher concentrations than USK4 and USK5. These locations are near the junction with Abergavenny Road. It is thought that the improvement in double yellow line enforcement, and the implementation of the Lorry Watch scheme has meant that congestion has improved through Bridge Street.

The three tubes in Woodside which were installed in 2017 have all been below the objective level. In 2022 the concentrations were  $15.4\mu\text{g}/\text{m}^3$  (WS3),  $17.8\mu\text{g}/\text{m}^3$  (WS1), and  $20.4\mu\text{g}/\text{m}^3$  (WS2). The highest reading for all tubes was  $29.6\mu\text{g}/\text{m}^3$  in 2017. This part of Usk is not at risk of exceeding the nitrogen dioxide objective level, however monitoring is continuing in 2023.

### **Chepstow & Pwllmeyric**

For the third year in a row (2020,2021,2022), there were no nitrogen dioxide exceedances in the Chepstow AQMA.

In total there have been three locations that have historically exceeded the nitrogen dioxide objective level in the Chepstow AQMA:-

- The Automatic Air Quality Monitoring Station, which last exceeded in 2011,
- CH6 which last exceeded in 2014, and
- CH4 which last exceeded in 2019.

General trends in Chepstow from diffusion tube data identifies that concentrations decreased from 2012 until 2015 remained stable until 2017, decreased in 2018 increased slightly in 2019, decreased significantly in 2020, and increased in 2021 but not to 2018 levels.

In 2022 the diffusion tube concentrations remained stable with 11 locations decreasing slightly ( $0.1\text{-}2.8\mu\text{g}/\text{m}^3$  decreases), one location remaining the same and two locations increasing slightly ( $0.1\text{-}0.3\mu\text{g}/\text{m}^3$  increase).

The automatic analyser showed a decrease from 2008 to 2018, with concentrations remaining somewhat stable between 2015 and 2018 of between  $35$  and  $37\mu\text{g}/\text{m}^3$ . However, there was a  $1.0\mu\text{g}/\text{m}^3$  increase in 2018 up from  $35$  in 2016 and 2017 to  $36$  in 2018, and a further  $3\mu\text{g}/\text{m}^3$  increase in 2019 to  $39\mu\text{g}/\text{m}^3$ , which was the highest concentration since 2012. In 2020 the concentration decreased to  $26\mu\text{g}/\text{m}^3$ ,  $8\mu\text{g}/\text{m}^3$  lower than the previous lowest concentration in 2006 and 2013, increased in 2021 to  $29\mu\text{g}/\text{m}^3$ , which until that point

was is the second lowest concentration recorded, but decreased to  $28\mu\text{g}/\text{m}^3$  in 2022, which is the lowest concentration recorded outside of the 2020 pandemic.

The one exceedance that still occurred (prior to 2020) is located at CH4 (Hardwick Hill). This location has exceeded the annual mean objective level every year since 2007.

CH4 increased between 2007 and 2012 to a high of  $60.3\mu\text{g}/\text{m}^3$ . However, until 2018 it steadily decreased in concentration to the low 50's between 2015 and 2017. In 2018 there was a large decrease (by  $8.6\mu\text{g}/\text{m}^3$ ) to  $42.5\mu\text{g}/\text{m}^3$ , and then further decreased slightly in 2019 to  $42.3\mu\text{g}/\text{m}^3$ , before falling to  $31.6\mu\text{g}/\text{m}^3$  in 2020. The concentration increased to  $36\mu\text{g}/\text{m}^3$  in 2021 but fell again in 2022 to  $33.9\mu\text{g}/\text{m}^3$ , which is the lowest concentration recorded other than 2020 pandemic year.

CH4 has always been highest concentration located at a house or other relevant receptor in the county, and remained the highest in 2022.

In October 2018 four diffusion tubes were installed in Pwllmeyric alongside the A48, southwest of the Chepstow AQMA. Three of the tubes were located on lampposts near the roadside (due to their being no suitable fixing locations on the nearest houses) and adjusted back to the nearest residential properties. One tube was installed on the downpipe of a house.

Concentrations at nearest receptors were all below the objective level in 2019, with the highest recording at  $29.9\mu\text{g}/\text{m}^3$ . In 2021 roadside concentrations were  $23.8\mu\text{g}/\text{m}^3$  (PWLL2),  $32.9\mu\text{g}/\text{m}^3$  (PWLL3) and  $35.8\mu\text{g}/\text{m}^3$  (PWLL1), and calculated concentrations at the nearest houses were  $21\mu\text{g}/\text{m}^3$ ,  $24.9\mu\text{g}/\text{m}^3$ , and  $19.3\mu\text{g}/\text{m}^3$  respectively. In 2022 concentrations at the diffusion tubes decreased slightly (the highest was  $33\mu\text{g}/\text{m}^3$  at both PWLL1 and PWLL3, and calculated concentration at the nearest houses were  $20.1$  (PWLL2),  $24.9$  (PWLL3), and  $17.0$  (PWLL1), with the measured concentration at PWLL4 (which is on a house downpipe) of  $15.5\mu\text{g}/\text{m}^3$ .



## Monmouth

Within Monmouth, monitoring is undertaken along the A40 and within the town centre. Concentrations over the preceding eight years generally decreased and then stabilised, with a further drop in 2020 due to the pandemic, and an increase in 2021. For example, one of the longer-term monitoring locations (MM1 – Wyebridge Street) reached its highest concentration in 2012 of 39  $\mu\text{g}/\text{m}^3$ , then reduced and stabilised at 33-34  $\mu\text{g}/\text{m}^3$  up until 2017 decreased again to 30.4 in 2019, and 22.9  $\mu\text{g}/\text{m}^3$  in 2020, and increased to 24.9 $\mu\text{g}/\text{m}^3$  in 2021.

Of the less well-established locations (installed in 2014 and 2015), the majority decreased in 2017 except for MM13 (Pike House) which increased by almost 3  $\mu\text{g}/\text{m}^3$  to 35.1  $\mu\text{g}/\text{m}^3$ , however decreased in 2018 to 32.5, to 30  $\mu\text{g}/\text{m}^3$  in 2019, and 20.6  $\mu\text{g}/\text{m}^3$  in 2020. It also increased in 2021 to 22.3 $\mu\text{g}/\text{m}^3$ , and increased again in 2022 to 25.4  $\mu\text{g}/\text{m}^3$ . This was the highest increase at all monitoring locations between 2021 and 2022.

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  $\mu\text{g}/\text{m}^3$  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  $\mu\text{g}/\text{m}^3$ , the 1-hour objective is unlikely to be exceeded, and as MM11 has consistently been in the mid 20 to low 30's (21.4  $\mu\text{g}/\text{m}^3$  in 2022) since installation in 2014, MCC are confident that the 1-hour objective level is not being exceeded at this location.

## Abergavenny

Nitrogen dioxide diffusion tube 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 (41.5 $\mu\text{g}/\text{m}^3$ ) 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. Those works are now complete however, therefore 2022 should not be affected.

AB1 is located on the north bound side of the road next to a 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 & Petrol Station, 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 seven 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.

Since the exceedance in 2012 at AB1 and the installation of AB2 opposite it, concentrations have not exceeded again, and there has been a general decrease at both sides of the road. In 2021 AB1 was  $29.8 \mu\text{g}/\text{m}^3$  and AB2 was  $25.5 \mu\text{g}/\text{m}^3$ , and in 2022 remained stable at  $31.3$  and  $25.3 \mu\text{g}/\text{m}^3$  respectively.

In June 2019 two additional monitoring locations (AB7 and AB8) were installed on Park Road (A40) to the north of the town centre, on each side of the road, due to a change in road alignments through the town, and the opening of a supermarket on that road. Of the three full calendar monitoring years in 2020 and 2021 neither location has exceeded  $20 \mu\text{g}/\text{m}^3$  with both remain stable at about  $17 \mu\text{g}/\text{m}^3$ .

In January 2020 AB6 which was located at the northern section of Merthyr Road, just before its junction with the A40/Brecon Road, was removed due to seven years of consistently low concentrations (range of  $21.8$  to  $24.3 \mu\text{g}/\text{m}^3$ ), and instead a location was established around the corner from it on the busier Brecon Road/A40 and labelled AB9. In 2020 the concentration was  $24.3 \mu\text{g}/\text{m}^3$ , and in 2021  $26.3 \mu\text{g}/\text{m}^3$ , and in 2022  $25.5 \mu\text{g}/\text{m}^3$ .

### 2.3.1 Particulate Matter (PM<sub>10</sub>)

In 2022 there were no exceedances identified of the PM<sub>10</sub> short term or long-term objective levels. PM<sub>10</sub> concentrations as recorded at the Air Quality Monitoring Station on Hardwick Hill in Chepstow have never exceeded the short or long-term objective levels.

#### Short Term Objective Level

The PM<sub>10</sub> short term objective level is: -

*Not to exceed an average of 50 µg/m<sup>3</sup> in a 24-hour period more than 35 times a year.*

The highest daily (12:00am-11:59pm) concentration in 2022 was 47µg/m<sup>3</sup>, which occurred on 25<sup>th</sup> March 2022, as such there were no 24-hour periods with a PM<sub>10</sub> concentration over 50 µg/m<sup>3</sup>, therefore the short-term objective level (no more than 35 times a year) was not exceeded. The most frequent daily concentration was 14 µg/m<sup>3</sup>.

This was a decrease compared to 2021 which had one day over 50 (62 µg/m<sup>3</sup>).

2019 recorded the greatest number of 24-hour exceedances at Chepstow with 7 days over 50 µg/m<sup>3</sup> (56, 58, 59, 59, 60, 62, 62 µg/m<sup>3</sup>). The previous highest was five days in 2015. There were no days of exceedance in 2018, therefore 7 days in 2019, whilst low in comparison to the 35 days that can be exceeded before a breach, was an unusual increase, that was not continued in 2020 and 2021 or 2022.

The cause of the 47 µg/m<sup>3</sup> on 25<sup>th</sup> March 2022 was due to a mixture of settled weather in the UK and light winds from continental Europe predicted between 22<sup>nd</sup> March – 28<sup>th</sup> March.

The daily PM<sub>2.5</sub> average was higher during this time as well (31µgm<sup>3</sup>).

#### Long Term Objective Level

The PM<sub>10</sub> long term objective level is:

*An annual average of 40 µg/m<sup>3</sup>.*

The World Health Organisation's guideline concentration for PM<sub>10</sub> annual mean is 20 µg/m<sup>3</sup>.

There has never been an exceedance of this objective level at Chepstow AQMS, and the last time the WHO's guideline value was exceeded was 2011 ( $22 \mu\text{g}/\text{m}^3$ ).

Between 2005 and 2015 PM<sub>10</sub> annual average concentrations steadily decreased year on year. There was a  $1 \mu\text{g}/\text{m}^3$  increase in 2016, but then a further decrease in 2017 when concentrations were at their lowest at  $16 \mu\text{g}/\text{m}^3$ . However, in 2018 there was an increase to  $18 \mu\text{g}/\text{m}^3$  and then again in 2019 to  $20 \mu\text{g}/\text{m}^3$ . Therefore, prior to COVID there appeared to be some evidence of an increasing trend in concentrations. However, lockdowns in 2020 resulted in a decrease to  $17 \mu\text{g}/\text{m}^3$ , which was 15% reduction over 2019, and this decrease continued into 2021 with an annual average of  $16 \mu\text{g}/\text{m}^3$ , which is the joint lowest annual average recorded (along with 2017), however there was an increase in 2022 back to  $18 \mu\text{g}/\text{m}^3$ .

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

The EU PM<sub>2.5</sub> annual limit value for PM<sub>2.5</sub> is:

An annual average of  $25 \mu\text{g}/\text{m}^3$ .

The World Health Organisation's guideline concentration for PM<sub>2.5</sub> annual mean is  $10 \mu\text{g}/\text{m}^3$ .

In 2022 the PM<sub>2.5</sub> annual average at the Chepstow Air Quality Monitoring Station on Hardwick Hill was  $9 \mu\text{g}/\text{m}^3$  and therefore did not exceed either the EU annual limit value of  $25 \mu\text{g}/\text{m}^3$ , nor the WHO's guideline concentration of  $10 \mu\text{g}/\text{m}^3$ .

Historically PM<sub>2.5</sub> concentrations have never exceeded the  $25 \mu\text{g}/\text{m}^3$  EU annual limit value. The highest concentration recorded was  $19 \mu\text{g}/\text{m}^3$  in 2010. Concentrations reduced to  $14 \mu\text{g}/\text{m}^3$  and then  $12 \mu\text{g}/\text{m}^3$  and remained stable between 2015 and 2018 at  $10 \mu\text{g}/\text{m}^3$  (2015),  $11 \mu\text{g}/\text{m}^3$  (2016) and  $10 \mu\text{g}/\text{m}^3$  (2017 and 2018). In 2019, concentration increased to  $13 \mu\text{g}/\text{m}^3$  and therefore whilst not in breach of the EU annual limit value ( $25 \mu\text{g}/\text{m}^3$ ), was higher than the World Health Organisation's guideline concentration of  $10 \mu\text{g}/\text{m}^3$ . The last time Chepstow exceeded this level was 2016.

In 2020 the concentration reduced to 9  $\mu\text{g}/\text{m}^3$ , and further reduced to 8  $\mu\text{g}/\text{m}^3$  in 2021, and increased back to 9  $\mu\text{g}/\text{m}^3$  in 2022.

## **2.4 Summary of Compliance with AQS Objectives as of 2021**

### **General Summary**

Monmouthshire County Council has examined the results from monitoring in the County. Concentrations are all below the Objectives, and 2022 resulted in significant decreases in concentrations compared to 2019 (pre-pandemic).

Nitrogen Dioxide did increase slightly in 2021 compared to 2020 and remained stable in 2022, with the majority of locations decreasing slightly. They remain significantly lower than 2019 and there were no exceedances of the annual or hourly objective levels.

Particulate Matter (both PM10 and PM2.5) reduced in 2021, but both increased in 2022 by 2  $\mu\text{g}/\text{m}^3$  (PM10) and 1  $\mu\text{g}/\text{m}^3$  (PM2.5), however did not exceed annual or short term objective levels.

### **Air Quality Management Areas**

When considering the 2019 data, concentrations within the Chepstow AQMA did exceed the objective for long-term nitrogen dioxide in one location, despite a large decrease between 2012 and 2019, therefore this AQMA will remain, however there was no exceedance in 2020, 2021, and 2022, and in 2022 there were no locations above 36  $\mu\text{g}/\text{m}^3$  (10% of the objective level) with the highest location reading 33.9  $\mu\text{g}/\text{m}^3$ .

Concentrations of nitrogen dioxide have not exceeded within the Usk AQMA for eight years (including 2020), however MCC does not intend to revoke the AQMA until seven years of non-exceedance of 36  $\mu\text{g}/\text{m}^3$  have been achieved (to account for the stated 10% uncertainty with diffusion tube monitoring), to factor in decreased traffic due to lockdowns in 2020 and 2021. In total there have now been five continuous years below 36  $\mu\text{g}/\text{m}^3$  in Usk between 2018 and 2022.

Other than 2020 most of the nitrogen dioxide diffusion tube monitoring locations in 2022 were at their lowest concentrations and most of the 2019 monitoring locations were at or close to their lowest ever recorded up until that point, therefore there appears to be a countywide trend of improving air quality. The exception to this is at the AQMS on Hardwick Hill, Chepstow, where concentrations of nitrogen dioxide, PM10 and PM2.5 (both long term, and short term) increased in 2019, however they did both reduce in 2020 and reduced further in 2021 to their lowest concentrations but increased slightly in 2022.

### **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.

The Local Development Plan was being revised and consulted upon in 2021. The outcome of this was to be reported on in the 2022 Progress Report however delays in the LDP process have occurred, and there is no update yet. Air Quality is a consideration in the LDP and planning applications, and Environmental Health are consultees, and are making comments throughout the process.

#### **3.1 Road Traffic Sources (and 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 newly identified road traffic sources since the last assessment.

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

### **4.1 Air Quality Planning Policies**

At a national level planning policy on air quality issues is set out in section 6.7 – Air Quality and Soundscape of Planning Policy Wales (Ed 11 – Feb 2021). This requires Local Planning Authorities to consider the effects which proposed developments may have on air quality and the effects which existing air quality may have on proposed developments. In considering the relationship between development and air quality planning authorities and developers must address any implications of any association with, or location within, an Air Quality Management Area, not create areas of poor air quality and seek to incorporate measures which reduce overall exposure to air pollution.

At a local level planning policy is set out in the Adopted Monmouthshire Local Development Plan (Feb 2014). Policy EP1 – Amenity and Environmental Protection, seeks to ensure development has regard to the amenity and health of occupiers in the locality of the development. It seeks to prevent development proposals that would result in unacceptable risk or harm due to air, light, noise or water pollution, contamination or land instability. Development proposals that would cause unacceptable risk/harm to local amenity, health, the character/quality of the countryside or interests of nature conservation, landscape or built heritage importance due to risks associated with pollution, including air, will not be permitted. The LDP notes that where it is considered a development proposal may impact on an Air Quality Management Area (AQMA), or exacerbate an existing problem, developers will be required to provide an assessment of air quality impact, together with proposals for mitigation. A copy of Policy EP1 is set out below for information.

#### **EP1 - Amenity and Environmental Protection**

Development, including proposals for new buildings, extensions to existing buildings and advertisements, should have regard to the privacy, amenity and health of occupiers of neighbouring properties.



Development proposals that would cause or result in an unacceptable risk /harm to local amenity, health, the character /quality of the countryside or interests of nature conservation, landscape or built heritage importance due to the following will not be permitted, unless it can be demonstrated that measures can be taken to overcome any significant risk:

- Air pollution.
- Light pollution.
- Noise pollution.
- Water pollution.
- Contamination.
- Land instability.
- Or any identified risk to public health or safety

Planning Policy Wales can be viewed via the following link: <https://gov.wales/planning-policy-wales>

The Adopted Local Development Plan can be viewed via the following link:

<https://www.monmouthshire.gov.uk/app/uploads/2017/05/Adopted-Local-Development-Plan-with-PDF-tags.pdf>

## **4.2 Local Transport Plans and Strategies**

As of September 2023, MCC is in the process of developing a new voluntary Local Transport Plan. The current draft is to be agreed by senior officers and members soon, there will then be public (online) consultation. This is expected to start 19 October 2023. It is expected that the council will then agree to a final draft in December 2023.

The current draft identifies that there is a whole new list of objectives, actions, measures, etc. The below text is the current situation, however as specified above, whilst this was relevant for 2022 and 2023, it will be replaced by the end of 2023.

The Monmouthshire LTP identifies the key transport issues relevant to the county, the high-level interventions needed to address these and the specific priorities for the local authority. The LTP includes a prioritised five-year programme of projects the council wishes to see delivered within between 2015 and 2020 as well as medium- and longer-term aspirations up to 2030.

The programme outlined in the LTP includes walking and cycling infrastructure, bus network, station and highways improvements, Cardiff Capital Region Metro schemes, 20mph limits and road safety schemes. In accordance with the guidance, it does not contain specific rail service and trunk road proposals.

The aim of the LTP is to facilitate and support the development of a modern, accessible, integrated and sustainable transport system for Southeast Wales, which increases opportunity, promotes prosperity for all and protects the environment; where walking, cycling, public transport, and sustainable freight provide real travel alternatives.

Delivery of proposals featured in the LTP will be subject to sufficient funding being available from external grant sources and from the Council's own budgets. The LTP will be the primary reference for bids for annual capital funding from the Welsh Government for transport infrastructure.

The Monmouthshire Local Transport Plan was approved by Welsh Ministers in May 2015 and can be viewed at the following link: -

<https://www.monmouthshire.gov.uk/app/uploads/2015/07/MLTP-MASTER-v1-1.pdf>

## **Transport in Monmouthshire**

As a rural county access to employment, education, and services is a major issue. Analysis from the Welsh Index of Multiple Deprivation 2011 suggests that access to services in our most isolated rural communities is poor. Of the 58 lower super output areas in Monmouthshire, 22.4% are in the most deprived 10% in Wales for access to services.

Transport relies heavily on the household car. 84.8% of households own a vehicle in Monmouthshire, compared to 77.1% in Wales, and 8.7% of households who own 3 or more cars.

In terms of commuting, more than 40% residents commute to work outside the county, compared to less than 30% across Wales. The most important destination is Newport, because of the counties' closeness to the English border there are also substantial flows to Bristol and Gloucestershire.

## Highways

The only motorways in the area are the M4 from Cardiff towards the second Severn Crossing and the M48 branch to Chepstow and the Severn crossing. There are regular issues with congestion on the M4 near Newport and this affects connectivity between Monmouthshire and Cardiff.

The following trunk roads go through Monmouthshire:

- A40, linking the M50 via Monmouth and Abergavenny with Brecon and west Wales
- A465, linking the Heads of the Valleys with Abergavenny and continuing towards Hereford
- A449, connecting Newport with the A40 towards Monmouth and the M50
- A4042, connecting Newport with Abergavenny
- A48/A466, from the M48 through Chepstow to the English border.

The motorways and trunk together make up the strategic road network in Monmouthshire. They play an important role in connecting Monmouthshire's key settlements with each other and with other key destinations within the Cardiff Capital Region and other neighbouring counties.

Below these there are county strategic roads which provide connections between key settlements and centres where these are not catered for by the trunk road network:

- A48 from Chepstow to the M4 Junction 24 the Coldra and Newport.
- A466 from Chepstow via Monmouth towards Hereford.
- A472 connecting the A449 near Usk with the A4042 near Pontypool.
- A4077 from Gilwern to Powys boundary.
- A4136 from Monmouth to Gloucestershire boundary.
- A4143 from Llanfoist to Brecon Road in Abergavenny.
- A4810 (former Llanwern Steelwork Road), linking the M4 Junction 23a at Magor with the A48 in Newport.
- B4245 from the A48 towards Magor

## Rail

Monmouthshire is served by three railway lines. In the south lies the South Wales Western Mainline (SWML), linking South Wales with Bristol and London. The sole station within Monmouthshire is Severn Tunnel Junction, which is served by trains towards Bristol and southwest England. It functions as parkway station for a wide area. Services are generally hourly with some additional peak services, however in the peak hours many trains are overcrowded, esp. towards Bristol. It is expected that Great Western line is to be electrified in about 2017 (including Cardiff – Bristol services).

The line to Gloucester branches off the SWML east of Severn Tunnel Junction, with stations at Caldicot and Chepstow. Local services are up to hourly, some fast services also serve Chepstow. The Marches Line, connecting south Wales and North Wales and Manchester, passes through the west and north of the county with a station at Abergavenny, which acts as a hub for a substantial hinterland. It is served by 1-2 trains per hour.

Train services from Monmouthshire stations to Cardiff are notably more expensive than services of equivalent distance on the core Valley Lines. For example, a day return from Ebbw Vale or Maesteg to Cardiff (28¾ and 28½ miles respectively) is £7.80 (Jan. 2015), while it is £9.40 from Severn Tunnel Junction (21¾ miles), £12.40 from Chepstow (29¼ miles) and £13.90 from Abergavenny (31¼ miles). For those commuting to work the difference is even greater – annual season tickets are £1076 from Ebbw Vale or Maesteg, £1664 from Severn Tunnel Junction, £2228 from Chepstow and £2316 from Abergavenny.

The Passenger growth of the stations in Monmouthshire has been substantial. Over the ten years of the Arriva Trains Wales franchise has been Abergavenny has seen growth of 43%, Caldicot 88%, Severn Tunnel Junction 92% and Chepstow 136%. Interchanges at Severn Tunnel Junction are estimated to have increased by more than 300%.

## Bus

Buses are the predominant public transport mode in Monmouthshire. There are hourly (or more frequent) services along the Newport – Caldicot – Chepstow corridor and from Abergavenny towards Pontypool and the Heads of the Valleys, predominantly operated on a commercial basis by Stagecoach and Newport Bus. Other trunk routes connecting Abergavenny, Newport and Chepstow with Usk and Monmouth as well as local services in Monmouth, Chepstow and Abergavenny are contracted by Monmouthshire County Council.

Monmouthshire County Council also operates the award-winning Grass Routes community transport flexible bus services serving all main towns and outlying areas. It is available to all residents of Monmouthshire, and those living in areas without any other regular service or those unable to use normal bus services.

### **4.3 Active Travel Plans and Strategies**

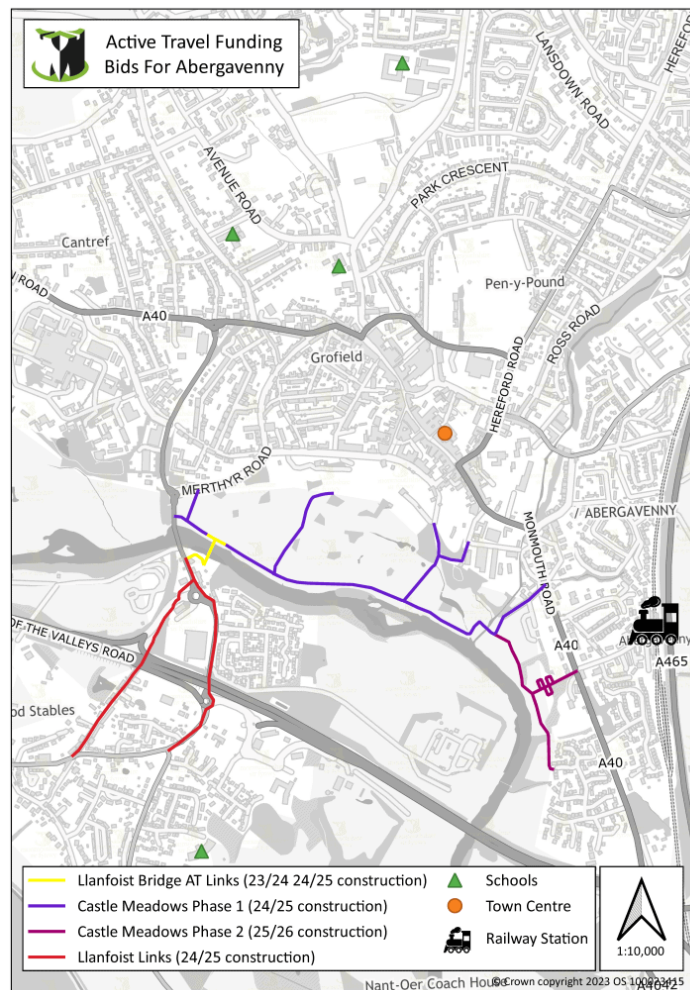
Under the The Active Travel (Wales) Act 2013, there is a requirement for authorities to continuously improve facilities and routes for pedestrians and cyclists (for AT journeys not leisure). The overall objective is to create a modal shift away from the car. The production of Active Travel Network Maps, which identify current and potential future routes, is a key legal requirement of the Act, as is for any new road schemes to consider the needs of pedestrians and cyclists at design stage. Active Travel has an important part to play in several existing policies adopted by Monmouthshire County Council, including reducing the carbon footprint with a move away from short car journeys.

Monmouthshire submitted their maps in December 2021 following a 2-year consultation process and have since had these signed off by the Welsh Government.

Each year, Welsh Government allows each Local Authority four strategic bids to be submitted for consideration to develop the Active Travel network for those routes identified on the Active Travel Network Maps. In 2022, Monmouthshire County Council was successful in their three geographical bids: Abergavenny, Caldicot x2 and Monmouth.

In 2022, Welsh Government approved the schemes detailed below. The text summarises the aspiration of each of the schemes. Many of the schemes will take over two years to complete.

## Overview for Abergavenny Strategic Scheme



This application concentrates on the Active Travel links needed between the areas of Llanfoist and the main town of Abergavenny. It is based on a new Active Travel bridge and associated links that will deliver a number of Active Travel benefits. The overall outcome of the scheme seeks to deliver:

- A new pedestrian/cycle bridge across the River Usk about 50 metres east of the existing Abergavenny Stone bridge (a scheduled monument and also Grade II\* listed).
- Further connections in the form of an off-road Active Travel route through Castle Meadows into the town centre and on to the train station.
- Improved links to Llanfoist from the new bridge.

The new bridge will become the main river crossing between Llanfoist and Abergavenny for Non-Motorised Users (NMU's). This will significantly reduce the risks associated with the

existing narrow footway over the existing Abergavenny Bridge and encourage greater modal shift as a result. It is also important to ensure effective connections from the bridge (new and existing) into the town centre, to housing settlements in Llanfoist and other key destinations, so there is a seamless route. Welsh Government has in the past funded previous studies on the Llanfoist Bridge. The bid seeks funding to complete critical stages in the development of the Active Travel network between the Llanfoist settlement and the centre of Abergavenny town.

### ***Bridge***

The scheme is listed in the LTP programme as 4th highest non-Metro priority. The scheme is Monmouthshire County Council (MCC) highest Active Travel Network Map (ATNM) priority for Abergavenny based on our recent Engagement phase and previous data. The scheme seeks to deliver a new pedestrian/cycle bridge across the River Usk about 50 metres east of the existing Stone bridge which is a Scheduled Monument and Grade II\* listed. The new bridge has been sympathetically designed by a renowned bridge Architect and it is proposed that it will become the main river crossing between Llanfoist and Abergavenny for non-motorised users. This will significantly reduce the health and safety risks associated with the existing narrow footway over the existing Bridge. Tasks to include: address pre-commencement planning conditions, procure contractor/s, purchase materials for bridge, implement bridge and associate links and Property Floor Resilience (PFR) measures.

### ***Meadows***

The scheme seeks to provide improved Active Travel compliant pedestrian and cycle links across Castle Meadows and Ysbytty Fields linking Llanfoist (via Llanfoist foot and cycle bridge) to Abergavenny town centre and Abergavenny rail station. Tasks to include:

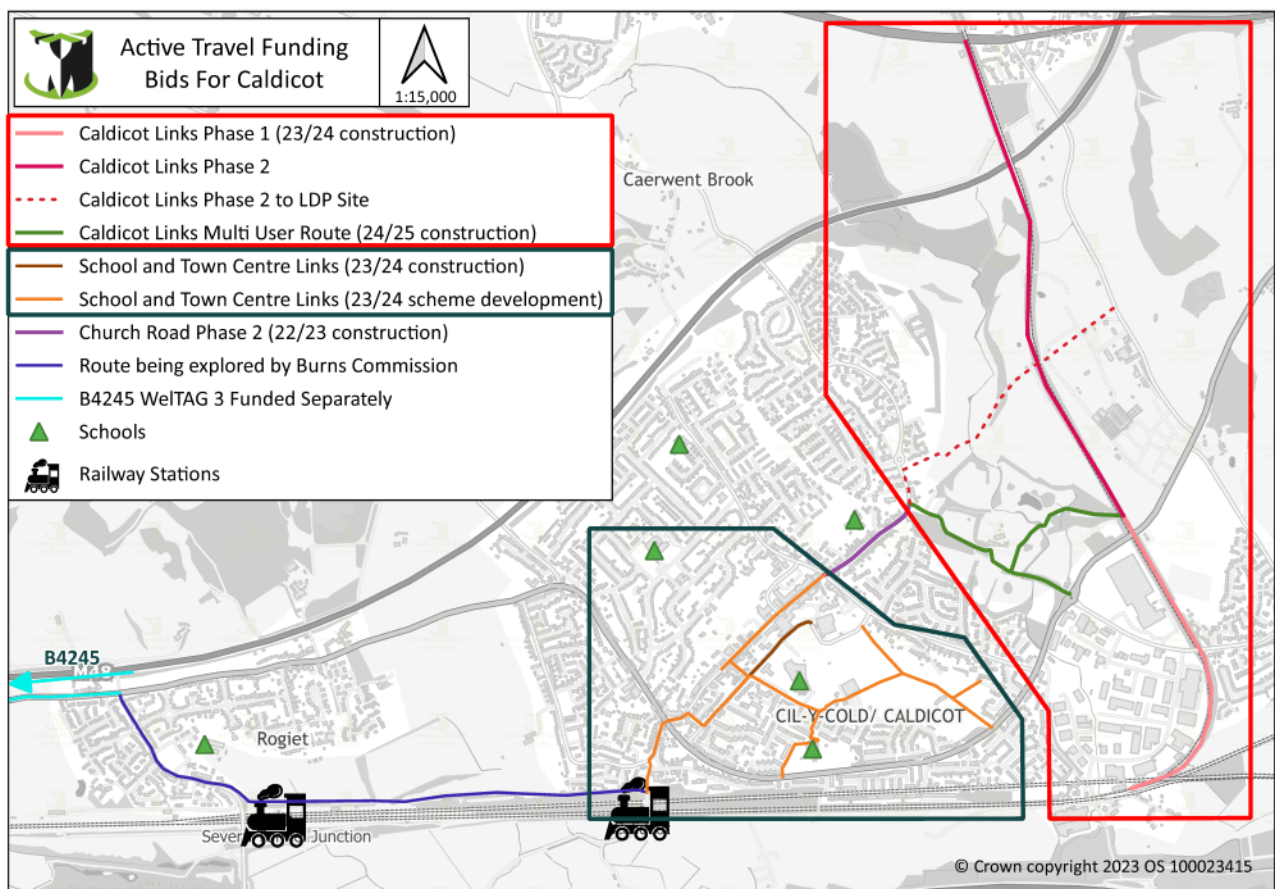
- Castle Meadows – achieve planning permission, address any pre-commencement conditions, achieve FRAP for River Gavenny bridge, procure a contractor.
- Ysbytty Fields (including A40/Station Road crossing) – subject to successful land negotiations, undertake further surveys, firm up design, submit planning, achieve planning permission, address any pre-commencement conditions, procure a contractor.

### ***Links***

The scheme seeks to provide improved Active Travel compliant pedestrian and cycle links between Llanfoist and the new Llanfoist foot and cycle bridge – where pedestrians and cyclists can then continue their journey onwards via Castle Meadows and Ysbytty Fields to Abergavenny Town Centre and Abergavenny Rail Station. Tasks to include:

- completion of WelTAG Stage 3 Study (including associated surveys, and design), prepare tender pack, enquire and submit planning (if required) and any pre-commencement planning conditions, procure contractor/s, and begin construction.

### Overview for Caldicot Strategic Scheme



### Caldicot 1

#### ***Scheme Description***

The Caldicot Links proposal is a multi-element scheme design that delivers on a phased approach. It aims to create an integrated network of routes that will have dedicated shared use facilities. It is also linked into green infrastructure, well-being activities, destination management and local economic development actions. This proposal would improve the



shared route through the Castle and Country Park and onwards to the MCC-S28 Caldicot Links providing connections between various housing developments, LDP sites and the town centre. All elements detailed below were the subject of an AT approved Welsh Government scheme in 2021-22 and 2022-23, construction funding was granted in 2022-23, but only tree clearance was delivered due to project slippage.

This proposal is to:

- Construction of Railway Phase 1 (Portskewett to Caldicot Castle) in 2023/24
- Continue with the detailed design, survey and consultation for disused MOD Railway Phases 2&3 (Caldicot Castle to Crick/Caerwent and LDP site connections) in 2023/24.
- To develop 2.81km long railway line into an Active Travel route serving a number of communities.
- Continue development of the Multi User route phase to gain planning and complete detailed design to tender ready stage in 23/24.
- This proposal seeks to create a new dedicated walking/cycling and in places horse riding, multi-user route, accessible for residents and visitors of the communities of Portskewett, Caldicot and Caerwent to access key destinations of employment and services.
- A phased construction of the project will begin in 202/24 to connect with other housing settlements in Caldicot and proposed new developments.
- Connect into Church Road (MCC-S03) so that an integrated approach to active travel within the eastern side links residents to employment, education and local services as well as onto public transport nodes.

## **Caldicot 2**

***Scheme description (subject to funding) – Only Design Costs funded this FY.***

### ***Phase 1 Construction – June 2023 to October 2023***

This phase of construction delivers the Active Travel infrastructure required to provide a safer and more direct route to Caldicot School for those travelling from the eastern side of Woodstock Way. It helps reduce the congestion caused at school start and finish times by offering pupils an alternative route to the school avoiding Mill Lane.

Alterations to the school and leisure centre car parks create a safer environment for walking, wheeling and cycling in this area, as well encouraging “park and stride”

This phase also delivers improvements to the Active Travel infrastructure in and around Durand Primary School as well as improving the route at the back of the school, making it more attractive to use the leisure centre car park to “park and stride”. A phasing schematic is provided for reference.

### ***Phase 1 Construction at Woodstock Way and Woodstock Way Car Park***

- Construction of shared path on the south eastern side of Woodstock Way between Mill Lane Junction and the junction at Aldi/Asda, (inclusive of drainage, dropped kerbs, tactile paving and zebra markings across accesses);
- Construction of a raised table and signalised toucan crossings on all three arms of the Aldi/Asda junction;
- Alterations to Woodstock Way car park to provide a pedestrian route through the car park to a new gated access to the main entrance to the school. This includes the demarcation of a shared path through the car park with zebra markings at crossing points, the relocation of the school boundary fence and provision of a new gate, and the construction of a new shared path linking the south eastern corner of the car park with the new school gate;

### ***Phase 1 Construction in the Vicinity of Durand Primary School***

- Widening of an existing alleyway to provide a shared path with low level lighting at the back of Durand Primary, (inclusive of relocation of school boundary fence and gate and provision of new landscaping and planting along the new fence line). The path starts at Curlew Avenue and runs along the alleyway behind the school to the boundary with the school’s wooded area;
- Demarcation of shared path on the existing shared surface at the north-eastern end of Alianore Road, (inclusive of zebra markings across the entrance to the school car park).
- Construction of shared path on the south-eastern side of Alianore Road, (inclusive of relocation of school boundary fence and gate and provision of new landscaping and planting along new fence line). The path runs from the exit from Duran Primary School car park to the signalised pedestrian crossing on Caldicot Bypass.

- Upgrade of the existing signalised pedestrian crossing to a Toucan Crossing on Caldicot Bypass near the junction with Alianore Road;
- Construction of a raised table at junction of Alianore Road with Stafford Road (inclusive of drainage).

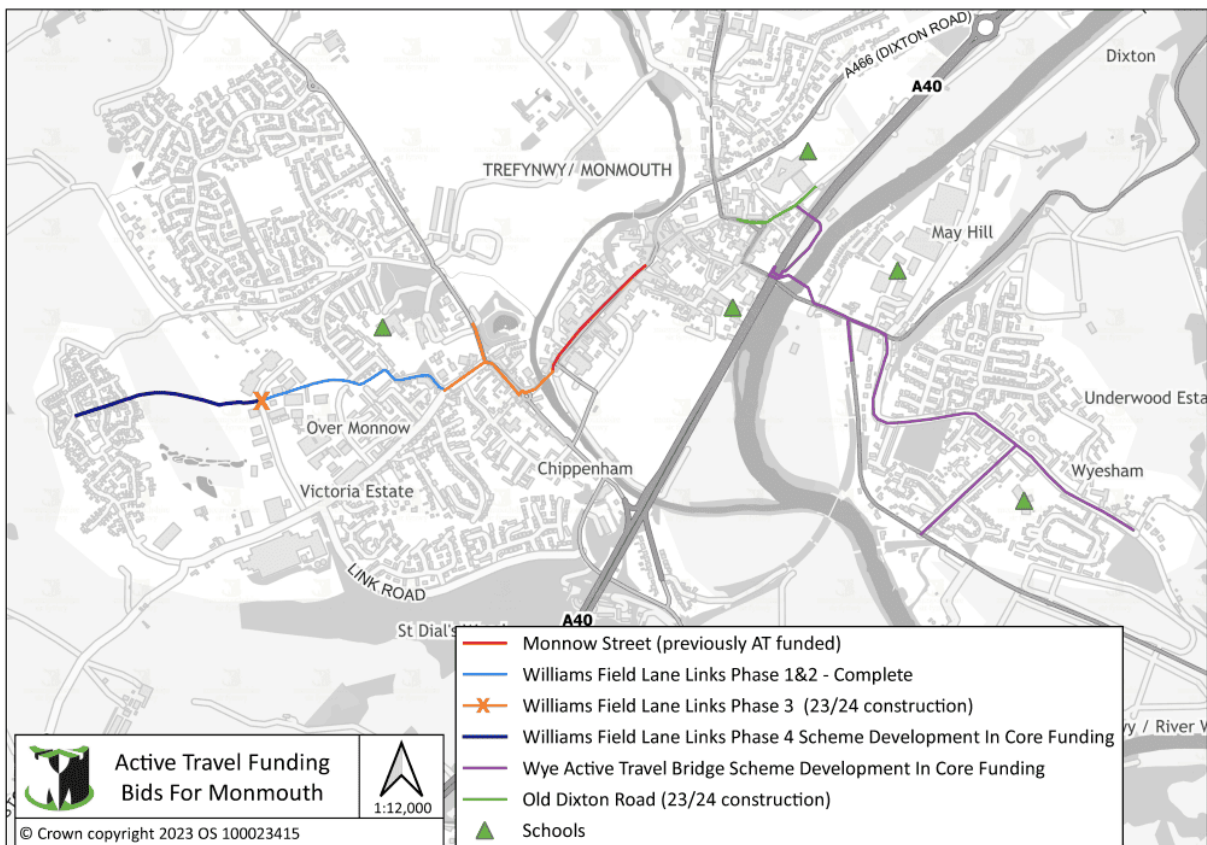
***Phase 1 Construction at Caldicot School and Leisure Centre Car Parks***

- Relocation of the school boundary fence and gate in the northern corner of the leisure centre car park to provide access for all to the existing footway, and construction of a new shared path to link the existing footway with the entrance to the leisure centre.
- Alterations to the car park layout at Caldicot School and leisure centre to combine the two car parks in to one, creating a one-way system for vehicles, a school bus drop off point for the leisure centre, and a pedestrianised area at the skate park;

***Detailed design of phase 2, including:***

- Crossing at Woodstock Way/Mill Lane
- shared use path along northside of Woodstock Way from Woodstock Ct to Town Centre.
- Mill Lane improvements for Comprehensive School (bus bays and shared use path) and Leisure Centre access
- Norman Ct and Newport Rd
- Station Rd
- Development of Phase 3, including paths to North and East of Leisure centre

## Overview for Monmouth Strategic Scheme



### ***Scheme description (subject to funding)***

#### **Old Dixton Road – Not Funded this FY**

This scheme to be constructed in 2023/24 is that which gained construction funding in 2021/22, but wasn't built due to high tender returns. The scheme aims to provide an off road shared used path from the Library, past the Comprehensive school, to the Leisure Centre in Monmouth. The designs were approved by our Sustrans Active Travel advisor and the project has remained shovel ready. Funding was not sought last financial year due to the timescales of delivery and bidding crossing over.

The scheme looks to:

- Provide a shared 3m path (with local narrowing's where carriageway widths don't allow full compliance).
- Raised table crossing to link through to future Wye Active Travel Bridge MCC-M04C

- Crossing point at Leisure Centre.
- Priority crossing over carpark entrances.
- New signage for shared use path
- Implementation of 20mph zone.
- Route length 290m

### **Williamsfield Lane Links**

This scheme to be constructed in 2023/24 is looking to create a shared use active travel route along Wonastow Road and Drybridge Street from Williamsfield Lane to the Monnow bridge. This scheme is a continuation of the previously constructed route along Williamsfield Lane, which was constructed in 2020/21 and 2021/22 with ATF monies including a new play park at King's Fee. The route will service links to education settings, such as Overmonnow Primary and Monmouth comprehensive and be a key link to the town centre and the facilities here. The crossing was moved from phase 2 to 3, following conversations and design agreement with our Sustrans advisor. Upon completion, there will be 2 sections left to finish this route, a stretch across the meadow to Kingswood Gate, which is in land negotiation and SUDs design, and a localised narrowing approaching the crossing. The scheme development of the remaining 2 sections of this route will be covered from our core funding allocation. Please see map for detail.

The scheme looks to:

- Provide a shared 3m path (with local narrowing's where carriageway widths don't allow full compliance).
- Replace a mini roundabout with T junction to aid active travel crossing and dissuade HGV users from using Wonastow Road and use the provided link route
- Deletion of on street parking to gain required widths
- Provide an additional link up to recreational facilities, such as the skate park and nature space.
- Priority crossing over side entrances.
- New signage for shared use path
- Install a toucan crossing on Wonastow Rd Industrial Estate
- Route length 403m

***For our Core funding we have:***

- Scheme development of Wye Bridge – Monmouth
- Scheme Development of Kingswood Gate AT Link – Monmouth
- Scheme Development of Abergavenny LDP Links
- Implementation of Quick Wins

**4.4 Local Authorities Well-being Objectives**

The Well-being of Future Generations (Wales) Act 2015 (Assessments of Local Well-being) Regulations 2017 require Public Services Boards, when preparing an assessment of local well-being under section 37 of the Act, to take into account the most recent review of air quality for their local authority area carried out under section 82 of the Environment Act 1995 (“the 1995 Act”) and the most recent strategic noise maps made under Chapter 2 of the Environmental Noise (Wales) Regulations 2006 (“the 2006 Regulations”) and adopted by the Welsh Ministers.

Monmouthshire County Council have incorporated the Well-being Objectives into its Community and Corporate Plan, and Monmouthshire’s Well-Being Assessment, which was updated in 2022, incorporates Air Quality:

[https://www.monmouthshire.gov.uk/app/uploads/2022/05/Well-Being-Assessment-22-27\\_Monmouthshire\\_Final.pdf](https://www.monmouthshire.gov.uk/app/uploads/2022/05/Well-Being-Assessment-22-27_Monmouthshire_Final.pdf).

This forms part of a wider Gwent Wellbeing Assessment:

<http://www.gwentpsb.org/well-being-plan/well-being-assessment/>

Monmouthshire Public Service Board has been replaced by a Gwent Public Service Board, who have produced a Wellbeing Plan for Gwent

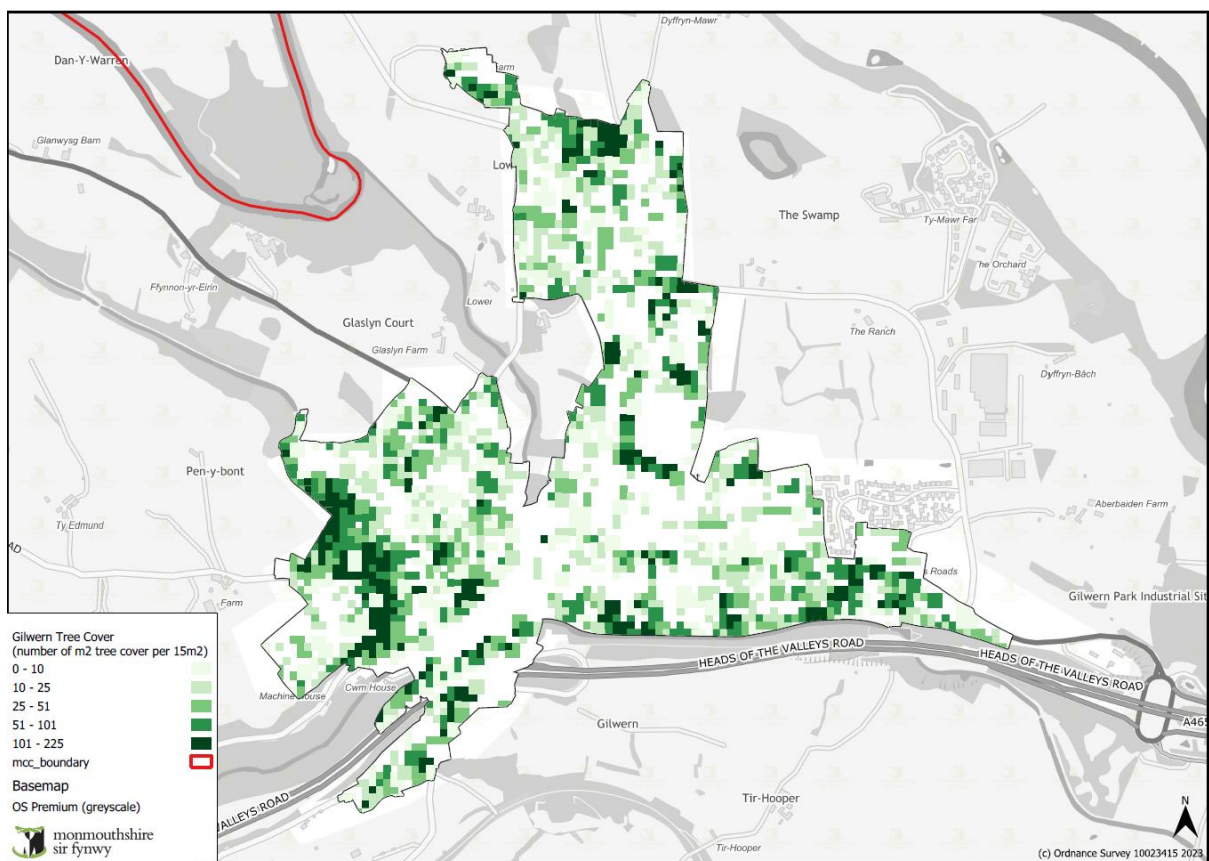
<http://www.gwentpsb.org/en/well-being-plan/gwent-well-being-plan/>.

Actions in the Gwent PSB plan will be overseen and delivered locally in Monmouthshire via a Local Delivery Group.

## 4.5 Green Infrastructure Plans and Strategies

Monmouthshire County Council's Green Infrastructure team have several projects planned or underway. Examples include: -

- Over the last three years have planted 14,000 tree whips and 600 trees as part of the climate change strategy
- Participating in an [i-Tree Eco study](#) in the Severnside settlements. The study will give an indication of the environmental benefits of trees and recommendations for planting and management. The study has been completed and the report is currently in draft, and due to be published late 2022.
- Mapping of the tree canopy cover for urban settlements providing visual interpretation of strengths, weaknesses, and planting priority areas. An example for the village of Gilwern is shown below:



## 4.6 Climate Change Strategies

Monmouthshire County Council declared a Climate Emergency in 2019 and published its first Climate Emergency Strategy and Action Plan in 2019. The action plan was refreshed in 2021 with a greater focus on nature recovery and climate adaptation, and can be seen here:

[https://www.monmouthshire.gov.uk/app/uploads/2021/12/Climate-and-Decarbonisation\\_Action-Plan-2021\\_v2.0.docx](https://www.monmouthshire.gov.uk/app/uploads/2021/12/Climate-and-Decarbonisation_Action-Plan-2021_v2.0.docx) .

Following the adoption of the Council's new Community and Corporate Plan, the Climate Emergency Strategy is being reviewed and updated.

The council is required to become carbon neutral by 2030 and also intends to work with communities and local businesses to help them reduce their emissions.



## 5 Conclusion and Proposed Actions

### 5.1 Conclusions from New Monitoring Data

The 2023 Progress Report did not identify any exceedances of nitrogen dioxide, PM<sub>10</sub> or PM<sub>2.5</sub> in 2022. This continued the trend from the COVID Pandemic in 2020, and 2021. In 2022 report it was discussed that it was possible that 2021 could have been an unusual year with decreased traffic as some COVID restrictions were still in effect for part of the year. However, there were no such restrictions in 2022, and monitored pollutants remained similar to 2021.

This was the third year in a row with no exceedances of nitrogen dioxide objective level. Prior to 2020 there continued to be one exceedance, in the Chepstow AQMA

2022 was the eighth running year with no nitrogen dioxide exceedances in the Usk AQMA. The Usk AQMA will remain in place however, until five years below 36 µg/m<sup>3</sup> (10% uncertainty margin of error) of compliance have been achieved. 2022 marked the fifth such year, however it was decided by the Usk Steering Group Members that both 2020 and 2021 would be excluded (due to lockdown measures), therefore seven continuous years will be required. As such it is possible that the Usk AQMA could be revoked in 2025 if both 2023, and 2024 remain below 36 µg/m<sup>3</sup> and there does not appear to be a clear upward trend in nitrogen dioxide concentrations.

Generally, nitrogen dioxide diffusion tube concentrations reduced from 2012 until 2018 and remained consistent in 2019, with a drop (due to the COVID-19 pandemic) in 2020, a slight increase in 2021 but still lower than other previous years, and stabilisation in 2022.

With regard to the automatic analysers in the AQMS: nitrogen dioxide, PM<sub>10</sub> and PM<sub>2.5</sub> concentrations reduced between 2011 and 2015, remained consistent until 2018, but increased in 2019. They all decreased in 2020, however nitrogen dioxide increased by 3 µg/m<sup>3</sup> in 2021 (but still 10 µg/m<sup>3</sup> lower than 2019 (29 µg/m<sup>3</sup> compared to 36 µg/m<sup>3</sup>), but PM<sub>10</sub> and PM<sub>2.5</sub> decreased further (both by 1 µg/m<sup>3</sup> to 16 and 8 µg/m<sup>3</sup> respectively).

However, in 2022, whilst nitrogen dioxide decreased by 1  $\mu\text{g}/\text{m}^3$ , both  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$  increased (by 2  $\mu\text{g}/\text{m}^3$  and 1  $\mu\text{g}/\text{m}^3$  respectively). Both do remain below 50% of their objective/target levels, however.

## 5.2 Conclusions relating to New Local Developments

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

## 5.3 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.

## 5.4 Proposed Actions

- The new monitoring has identified that there is no need to declare a new AQMA and no need for further investigation or assessment of any pollutant.
- There are no changes proposed to the two AQMAs, which will remain in place.
- Extended monitoring will continue in Abergavenny, Monmouth, Pwllmeyric and Woodside, but no additional monitoring will be required in 2024 over that already being undertaken in 2022 and being undertaken in 2023.
- 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.
- The Air Quality Progress Report will be completed in 2024.

## References

Environment Agency (2015) Study of Ambient Air Quality at Monmouth 18 December 2014 – 2 June 2015

Defra (2016) Local Air Quality Management: Technical Guidance.TG (16).

Welsh Government (2017) Local air quality management in Wales Policy guidance PG(W)(17)

Monmouthshire County Council (2007) Further Assessment of Air Quality in Usk.

Monmouthshire County Council (2003) Updating and Screening Assessment.

Monmouthshire County Council (2004) Interim Detailed Assessment.

Monmouthshire County Council (2005a) Detailed Assessment.

Monmouthshire County Council (2005b) Progress Report.

Monmouthshire County Council (2006) Updating and Screening Assessment.

Monmouthshire County Council (2008a) Further Assessment of Air Quality in Chepstow.

Monmouthshire County Council (2009) Updating and Screening Assessment.

Monmouthshire County Council (2012) Updating and Screening Assessment

Monmouthshire County Council (2014) Adopted Local Development Plan 2011-2021

Monmouthshire County Council (2015) Updating and Screening Assessment

Monmouthshire Public Service Board (2018) Well-being Plan

Monmouthshire County Council (2019) Climate Emergency Strategy

Monmouthshire Public Service Board (2021) Well-being Plan Annual Report

Monmouthshire County Council (2008- 2022) Progress Reports

MCC Air Quality Reports and Action Plans are available –

<https://www.monmouthshire.gov.uk/air-quality/>

## **Appendices**

Appendix A: Monthly Diffusion Tube Monitoring Results

Appendix B: A Summary of Local Air Quality Management

Appendix C: Air Quality Monitoring Data QA/QC

Appendix D: AQMA Boundary Maps

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

Table A.1 – Full Monthly Diffusion Tube Results for 2022 ( $\mu\text{g}/\text{m}^3$ )

Diffusion Tube ID	NO <sub>2</sub> Mean Concentrations ( $\mu\text{g}/\text{m}^3$ )												Simple Annual Mean ( $\mu\text{g}/\text{m}^3$ )		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.83) <sup>1</sup>	Distance Corrected to Nearest Exposure <sup>2</sup>
CH1	31.2	20.3	18.2	16.8	14.9	12.2	14.3	15.0	13.9	15.7	19.0	24.3	18.0	14.9	
CH2a	40.6	31.4	39.4	35.1	27.6	24.8	30.7	31.6	29.9	30.8	36.0	37.6	32.9	27.3	21.9
CH3	33.3	31.2	28.6	23.8	25.7	23.1	23.2	23.1	23.8	28.0	32.0	29.1	27.1	22.5	
CH4	44.3	48.1	41.3	40.6	37.0	35.9	42.4	37.7	33.1	41.9	45.6	42.4	40.8	33.9	
CH5	33.5	25.1	19.8	18.4	21.8	18.3	21.1	19.4	20.6	23.6	28.7	29.4	23.3	19.3	
CH6	47.9	41.0	38.3	30.4	22.2	23.1	24.9	24.0	25.0	28.1	33.1	42.9	31.7	26.3	
CH7	32.2	23.5	32.4	25.9	20.7	20.6	23.8	23.2	21.0	25.6	26.5	28.7	25.3	21.0	
CH8	29.7	25.5	29.4	23.3	21.8	19.6	24.9	22.0	21.3	26.1	29.8	29.4	25.2	20.9	
CH9	27.8	21.5	25.3	22.3	21.6	21.3	24.6	23.3	23.3	26.8	28.1	29.5	24.6	20.4	

Diffusion Tube ID	NO <sub>2</sub> Mean Concentrations (µg/m <sup>3</sup> )												Simple Annual Mean (µg/m <sup>3</sup> )		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.83) <sup>1</sup>	Distance Corrected to Nearest Exposure <sup>2</sup>
AQ1	45.4	39.8	34.3	33.7	31.3	28.8	31.4	30.5	30.2	29.8	39.4	34.7	-	-	
AQ2	45.2	41.1	34.9	32.8	30.2	28.3	31.9	31.1	31.0	33.2	39.0	35.3	-	-	
AQ3	47.7	41.9	32.8	32.0	32.1	29.5	32.4	32.6	31.7	34.2	39.2	37.0	34.6	28.7	
PWLL1	53.3	38.3	41.2	36.4	36.9	34.0	41.4	38.2	36.9	35.9	44.1	40.3	39.7	33.0	17.9
PWLL2	34.3	24.5	32.9	28.4	25.5	22.2	26.5	25.7	25.0	25.0	29.2	30.7	27.5	22.8	20.1
PWLL3	48.0	35.8	41.2	44.2	29.0	34.8	43.5	42.6	40.0	34.9	M	43.5	39.8	33.0	24.9
PWLL4	25.1	15.9	23.4	20.1		12.1	15.8	18.0	16.2	15.6	19.8	23.1	18.7	15.5	
MM1	33.0	29.7	32.7	26.5	26.1	25.8	28.8	27.8	26.0	31.4	42.7		30.0	24.9	
MM2	27.1	17.3	27.5	20.5	20.0	19.2	19.7	24.3	21.7	22.0	27.0		22.4	18.6	
MM3	27.5	17.5	25.0	17.7	17.6	15.5	17.0	19.9	19.4	22.1	25.7	25.8	20.9	17.3	
MM4	26.9	22.5	21.8	17.8	18.6	18.0	19.7	20.0	19.0	24.1	38.2	27.1	22.8	18.9	
MM7	24.6	17.5	26.1	18.8	18.6	19.7	20.5	21.6	21.8	22.1	25.5	24.6	21.8	18.1	

Diffusion Tube ID	NO <sub>2</sub> Mean Concentrations (µg/m <sup>3</sup> )												Simple Annual Mean (µg/m <sup>3</sup> )		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.83) <sup>1</sup>	Distance Corrected to Nearest Exposure <sup>2</sup>
MM9	21.9	14.4	21.7	15.5	14.6	13.0	16.8	18.1	16.4	17.4	21.1	21.7	17.7	14.7	
MM11	27.4	16.9	34.3	29.2	21.8	21.1	25.6	30.3	28.0	22.9	26.5		25.8	21.4	
MM13	32.1				28.8	27.9	31.0	30.6	30.3	34.3		29.7	30.6	24.4	
MM15	32.3	26.5	33.1	28.2	23.6	25.4	26.8	28.3	26.3	25.2	28.2	29.3	27.8	23.1	
MM16	28.3	21.7	26.5	22.1	19.0	17.5	20.8	23.6			32.6	28.6	24.1	20.0	
MM17	24.0	16.5	20.6		13.8	13.3	15.0	17.1	16.6	14.8	22.1	24.8	18.1	15.0	
MM18	26.9	21.5	26.0	18.3	21.3	20.4	23.3	24.8	22.2	23.6	26.0	26.0	23.4	19.4	
MM19	32.8	19.9	32.2	22.9	20.4	20.5	23.2	26.5	26.5	23.6	27.6	28.9	25.4	21.1	
MM21	32.4		29.0	25.4		20.0	23.6	27.9	26.6	22.8	27.2		26.1	21.7	
AB1	40.3	42.2	42.5	33.4	32.1	31.3	33.2	32.8	33.3	36.8	48.9	45.2	37.7	31.3	29.7
AB2	38.3	34.3	32.4	26.0	23.6	23.7	26.8	29.2	27.1	30.9	36.1	38.1	30.5	25.3	
AB3	28.4	24.8	25.9	22.6	21.5	18.3	24.1	26.0	23.0	21.6	27.7	27.8	24.3	20.2	

Diffusion Tube ID	NO <sub>2</sub> Mean Concentrations (µg/m <sup>3</sup> )												Simple Annual Mean (µg/m <sup>3</sup> )		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.83) <sup>1</sup>	Distance Corrected to Nearest Exposure <sup>2</sup>
AB4	32.2	22.3	29.2	24.2		17.1	19.6	25.3	24.2		30.6	30.4	25.5	21.2	
AB5	22.8	14.8	20.2	15.8	12.6	11.5	14.1	15.7	17.1	14.7	21.6	22.1	16.9	14.0	
AB7	22.3	18.3	19.8	13.9	15.6	14.0	18.7	21.0	21.4	24.7	29.9	31.8	21.0	17.4	
AB8	33.3	19.2	26.8	21.5	18.5	15.3	16.1	14.1	14.7	19.8	23.4	22.4	20.4	16.9	
AB9	38.2	31.8	33.9	26.9	26.1	25.1	31.1	26.8	26.1	31.9	36.8	34.6	30.8	25.5	
USK1	31.9	22.4	25.2	20.8	19.4	12.3	21.2	20.4	19.6	22.1		28.7	22.2	18.4	
USK2	35.6	24.8	33.1	25.5	24.4	24.0	26.0	27.9	26.4	31.2	35.2	36.3	29.2	24.2	
USK3	38.2		32.5	28.0			25.5	25.8	27.0	28.7	30.3	30.9	29.7	24.6	
USK4	35.8	24.4	31.1	26.6	24.2	21.5	17.7	26.4	25.8	28.4	35.6	32.2	27.5	22.8	
USK5	35.8	24.1	30.7	28.8	25.3	22.9	26.5	27.9	27.7	27.3	32.4	33.0	28.5	23.7	
USK6	24.5	16.5	19.1	16.2	13.8	12.0	13.4	14.3	14.9	15.4	19.2	22.1	16.8	13.9	
WS1	29.7	22.2	24.9	22.0	18.1	16.7	19.6	14.8	20.7	20.0	23.9	25.1	21.5	17.8	



Diffusion Tube ID	NO <sub>2</sub> Mean Concentrations (µg/m <sup>3</sup> )												Simple Annual Mean (µg/m <sup>3</sup> )		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.83) <sup>1</sup>	Distance Corrected to Nearest Exposure <sup>2</sup>
<b>WS2</b>	30.4	22.1	25.7	22.7	22.3	21.4	24.5	23.9	24.3	23.9	28.1	26.4	24.6	20.4	
<b>WS3</b>	25.6	13.8	23.5	17.3	14.9	13.9	15.9	19.2	18.7	17.5	20.0	22.0	18.5	15.4	

**Notes:**

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

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective are shown in **bold and underlined**.

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

(2) Distance corrected to the nearest relevant public exposure only if uncorrected concentration is over 36µg/m<sup>3</sup> (10% of objective level). Values shown are for information only.

## **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 the air quality objectives are being achieved. Where exceedances occur, or are likely to occur, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) within 18 months of declaration setting out the measures it intends to put in place in pursuit of the objectives. Action plans should then be reviewed and updated where necessary at least every five years; or if a local authority considers there is a need for further or different measures to be taken in order to achieve air quality standards; or if significant changes to sources occur within your local area.

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

### **Air Quality Objectives**

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

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

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

<b>Pollutant</b>	<b>Air Quality Objective: Concentration</b>	<b>Air Quality Objective: Measured as</b>	<b>Date to be achieved by</b>
<b>Nitrogen Dioxide (NO<sub>2</sub>)</b>	200µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
<b>Nitrogen Dioxide (NO<sub>2</sub>)</b>	40µg/m <sup>3</sup>	Annual mean	31.12.2005
<b>Particulate Matter (PM<sub>10</sub>)</b>	50µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	24-hour mean	31.12.2010
<b>Particulate Matter (PM<sub>10</sub>)</b>	40µg/m <sup>3</sup>	Annual mean	31.12.2010
<b>Sulphur dioxide (SO<sub>2</sub>)</b>	350µg/m <sup>3</sup> , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
<b>Sulphur dioxide (SO<sub>2</sub>)</b>	125µg/m <sup>3</sup> , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
<b>Sulphur dioxide (SO<sub>2</sub>)</b>	266µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
<b>Benzene</b>	16.25µg/m <sup>3</sup>	Running annual mean	31.12.2003
<b>Benzene</b>	5µg/m <sup>3</sup>	Annual mean	31 12 2010
<b>1,3 Butadiene</b>	2.25µg/m <sup>3</sup>	Running annual mean	31.12.2003
<b>Carbon Monoxide</b>	10.0mg/m <sup>3</sup>	Maximum Daily Running 8-Hour mean	31.12.2003
<b>Lead</b>	0.25µg/m <sup>3</sup>	Annual Mean	31.12.2008

## Appendix C: Air Quality Monitoring Data QA/QC

### QA/QC of Diffusion Tube Monitoring

#### Diffusion Tube Annualisation

All but one (MM13) diffusion tube monitoring locations within Monmouthshire recorded data capture of over 75% therefore it was not required to annualise any monitoring data, other than MM13.

MM13 lost four months of data, due to the tube being taken or thrown on the floor. Details of the annualisation calculation method undertaken are provided in Table C.2

There were no sites with a data capture below 25% (these also would not have required annualisation).

#### Diffusion Tube Bias Adjustment Factors

Monmouthshire County Council have applied a national bias adjustment factor (BAF) of 0.83 to the 2022 monitoring data. A summary of bias adjustment factors used over the past five years is presented in table C.1.3

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

The 2022 national Bias Adjustment Factor calculated for Gradko in March 2023 (03/23) was 0.83. It was based on 27 studies, including the local co-location study undertaken by Monmouthshire County Council (see below – Local Co-location 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.

A local bias adjustment factor (BAF) has been calculated for the Hardwick Hill, Chepstow automatic site. The triplicate tubes in twelve months showed good precision with each other (with a Coefficient of Variation below 20% in each month (CV range was 1-7%), and 100% data capture. The calculations are shown in Table C.1.1

**Table C.1.1 – Local Bias Adjustment Calculations**

	Local Bias Adjustment
Periods used to calculate bias	12
Bias Adjustment Factor A	0.81 (0.77 - 0.86)
Diffusion Tube Bias B	23% (17% - 30%)
Diffusion Tube Mean ( $\mu\text{g}/\text{m}^3$ )	34.6
Mean CV (Precision)	2.9%
Automatic Mean ( $\mu\text{g}/\text{m}^3$ )	28.1
Data Capture	100%
Adjusted Tube Mean ( $\mu\text{g}/\text{m}^3$ )	28 (27 - 30)
Overall Diffusion Tube Precision	Good Overall Precision
Overall Continuous Monitor Data Capture	Good Overall Data Capture
Local Bias Adjustment Factor	0.81

### Discussion of Choice of Factor to Use

The national bias adjustment factor based on the co-location studies of 27 local authorities who submitted by March was 0.83, whilst the local bias adjustment factor based on the Chepstow co-location study was 0.81. The national factor was used, as it included 27 studies of good precision and is more conservative than the Chepstow local BAF.

Table C.1.2. Below is a comparison of using the two different BAF for the highest location diffusion tube in each town). No conclusions or discussions in this report would have changed based on the use of either of the two Bias Adjustment Factors.

**Table C.1.2 – Comparison of different BAF’s on concentrations**

Location/Reference	0.83 National	0.81 Chepstow Local
Chepstow - CH4	33.9	33.1
Monmouth -MM1	24.9	24.3
Abergavenny – AB1	31.3	30.5
Usk – USK3	24.6	24.0

**Table C.1.3 – Bias Adjustment Factor – last 5 years**

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	03/23	0.83
2021	National	03/22	0.84
2020	National	03/21	0.77
2019	National	03/20	0.93
2018	National	06/19	0.92

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

No diffusion tube NO<sub>2</sub> monitoring locations within Monmouthshire County Council required distance correction as none of the 4 locations that have been distance corrected in the past had concentrations greater than 36µg/m<sup>3</sup>.

**Table C.1 – Annualisation Summary (concentrations presented in  $\mu\text{g}/\text{m}^3$ )**

Site ID	Annualisation Factor			Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
	Cwmbran Crownbridge	Cardiff Centre	Leominster			
MM13	0.8370	1.0224	1.0201	0.9598	30.6	29.3

## QA/QC of Automatic Monitoring

- Ricardo & Bureau Veritas completes the data management and Monmouthshire County Council – Environmental Health undertake the Local Site Operator (LSO) duties for the automatic monitoring site within the authority.
- Calibrations, audit and servicing are carried out every six months.
- Ricardo AEA undertake the Ratification process. The monitoring data presented within the APR is ratified.
- Live/historic data is available through the Welsh Air Quality Forum website <https://airquality.gov.wales/>

### PM<sub>10</sub> and PM<sub>2.5</sub> Monitoring Adjustment

The type of PM<sub>10</sub>/PM<sub>2.5</sub> monitor(s) utilised within Monmouthshire County Council are BAM and thus do not require the application of a correction factor.

### Automatic Monitoring Annualisation

All automatic monitoring locations within Monmouthshire County Council recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 33% do not require annualisation.

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

No automatic NO<sub>2</sub> monitoring locations within Monmouthshire County Council required distance correction.

# Appendix D: AQMA Boundary Maps

Figure D.1 – Chepstow AQMA

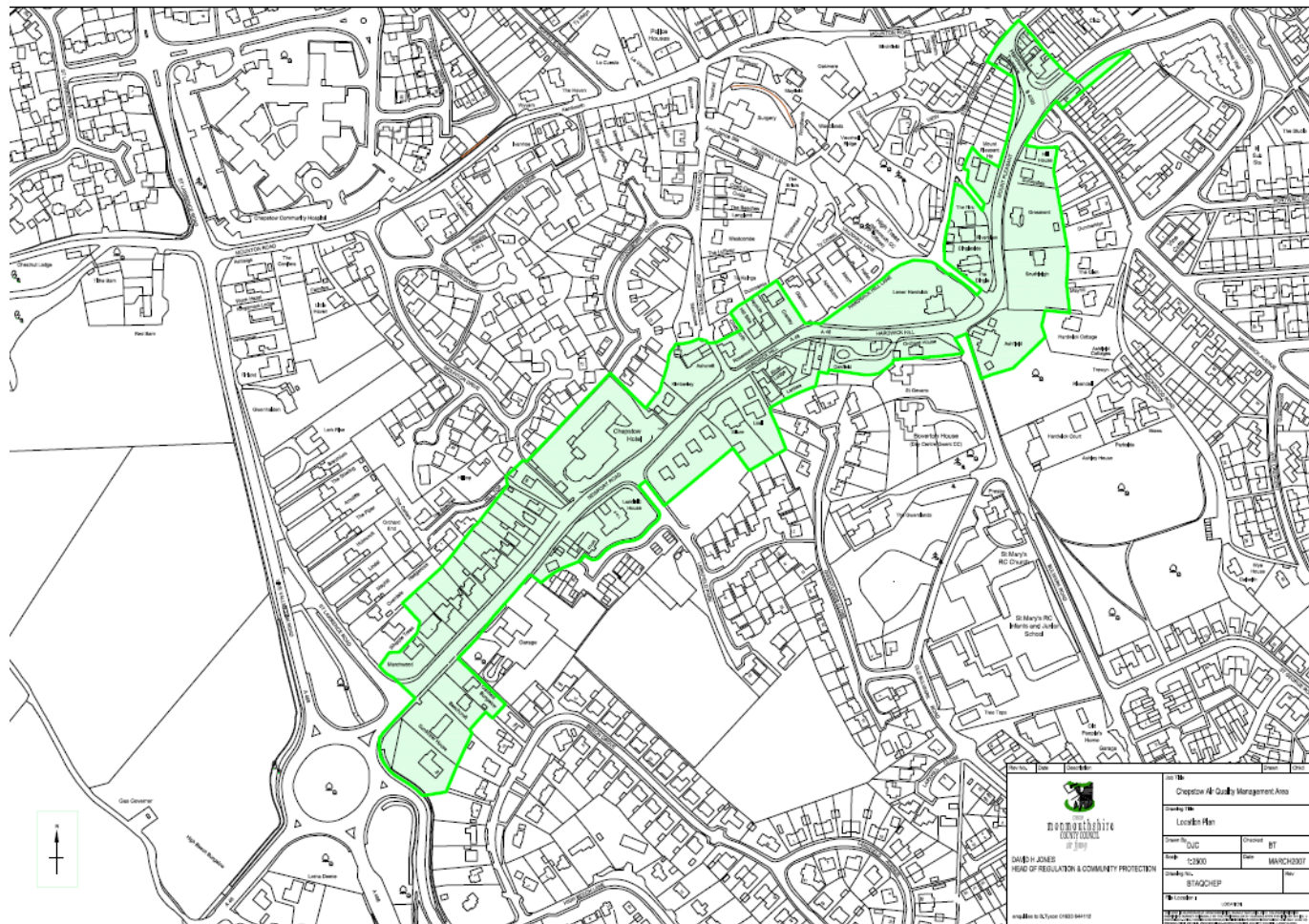




Figure D.2 – Usk AQMA



## Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM <sub>2.5</sub>	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO <sub>2</sub>	Sulphur Dioxide