Carmarthenshire County Council 2022

Air Quality Progress Report

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

Date: (September, 2022)

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Executive Summary: Air Quality in Our Area

Air Quality in Carmarthenshire

The main air quality pollutant relevant to Carmarthenshire is Nitrogen Dioxide (NO_2) and the main source of NO_2 emissions in the County is road traffic. We have developed a monitoring network that follows some of our busiest roads and most congested streets to enable us observe trends in NO_2 concentrations and assess the effectiveness of any changes made in attempt to improve air quality in those areas.

The Nitrogen Dioxide trends observed during 2021 have continued to decrease in comparison to 2017, 2018 and 2019 however monitoring results have observed an increase compared to 2020. No sites within the Carmarthenshire Air Quality Management Areas have exceeded the Air Quality Objective for 2021 for the second year running. Two sites; one based in Carmarthen and one based in Llanelli had however remained marginally compliant of exceeding the Air Quality Objective. This is a great improvement from 2019 where it was reported that one site had exceeded the AQO in the County and three further sites remained marginally compliant.

This trend is promising, however there are many factors that may be influencing these results year on year, including the weather and vehicles generally getting cleaner as older ones are replaced. The significant reduction of Nitrogen Dioxide during 2020, was not surprising given the COVID19 Pandemic resulted in many travel restrictions during the lockdowns, this limited non-essential travel for a period of time, and restricted distance and reasons to travel. There were also long periods where schools were closed and working from home arrangements continued to be encouraged where it was possible, even after other restrictions had eased.

2021 observed more normal travel behaviours compared to 2020, however it also experienced a ‘COVID lockdown’ during the first couple of months of the year, with a phased return of shops and schools opening between March and April 2021. It was not until August 2021 that all restrictions fully ended, so we certainly observed an overall reduction in traffic levels during 2021. Still despite traffic levels largely returning, many businesses along with this Council, continued to allow home working and hybrid working arrangements. This helps to discourage unnecessary travel through the County, and is a

positive contribution within our own Authority, given that many of our offices are located within the Air Quality Management Areas (AQMA's).

Although we are observing a marginal downward trend, year on year, with a significant improvement observed over the last two years. When excluding the impact of the COVID pandemic, it is difficult to suggest that there has been such a significant reduction identified over the last three years that it should warrant changes at this time, to the AQMA's. As mentioned, the influence of the weather can play a significant part. Wind and rain can help to disperse pollutants more readily, and increased sunshine can also reduce the levels of Nitrogen Dioxide in the air through chemical reactions.

Although the start of 2021 was colder than average, overall, 2021 was warmer than average giving the 5th warmest July and 3rd warmest Autumn since 1884, it was also sunnier than average, particularly during April, June and July. Despite experiencing heavy rainfall during May, rainfall was average for the year. This type of climate will have some influence over the results that we are observing, and therefore it is important to continue to compare future years in case weather patterns change significantly.

It was expected that we would see a much greater reduction during 2020 -2021 given the reduced travel at periods during those years. However, this will not reflect the typical travel behaviours pre-COVID-19 and so it is important we continue to monitor the AQMA's beyond the pandemic period. It is not predicted that as much decrease in levels of Nitrogen Dioxide will be observed during 2022 in comparison to the last two years, following a return of the more typical travel behaviours.

It is too early to determine if there will be any exceedances for 2022, because 2022 did experience a warm and sunny summer period providing some lower monthly readings of NO_2 than in 2021. Depending on the results we observe over the winter, it could indicate that we will again observe an increase in levels of NO_2 during 2022 compared to 2021. However, hopefully the overall downward trend will continue compared to pre-pandemic years. The site with the greatest risk of reporting an exceedance for 2022 is near 85 Priory Street, Carmarthen. This area continues to provide the highest readings in the County.

Carmarthenshire currently has three Air Quality Management Areas (AQMA) in Llandeilo, Carmarthen and Llanelli. Further details can be found on our website: https://www.carmarthenshire.gov.wales/home/council-services/environmental-health/air-quality/#.W46Mg-mQzIU

The Llandeilo AQMA was designated in 2011 and an action plan was later developed in 2014. The fourth-year review of the Llandeilo action plan was conducted in 2019 and included in the 2019 Air Quality Progress Report. The outstanding options of the Llandeilo Action plan are largely under consideration within the Llandeilo and Ffairfach Transport Study commissioned by Welsh Government, due to the function of the Strategic Trunk Road of the A483. Sadly, announcement of the recommended preferred outcome of this work continues to be postponed. The COVID-19 pandemic has unfortunately delayed progress on this work and the review the Llandeilo Action Plan. It was planned to conduct this review in 2021, however we will continue to work closely with partners involved in this study to monitor progress with those outstanding options and compliance in this area. 2021 is the third year running where all monitoring sites in Llandeilo complied with the AQO.

The AQMA's for the towns of Carmarthen and Llanelli were designated and Orders issued in August 2016. Action Plans for both towns were subject to public consultation during 2017. Responses were reviewed and draft Action Plans were submitted to Welsh Government late 2017. Although work has already began to assess and deliver some of the proposed measures in these Action Plans, the final Action Plan for Carmarthen and Llanelli was submitted to Welsh Government late 2019.

No new major sources of uncontrolled pollution or fugitive emissions have been identified within the County during 2021 and although many developments are underway, some of which have required air quality impact assessments to be conducted, no significant impacts have been identified. The requirement to adhere to an approved dust/construction management plan can be quite effective in reducing the risk to a negligible impact. Nevertheless, collaboration work with planners and developers continues and wherever possible further measures are encouraged to mitigate any impact that development may pose on air quality.

Two locations incorporating a Biomass boilers have been identified and screened to assess any impacts they may pose on the environment and local air quality. The sites are not within any of the AQMA's and are operating under the Renewable Heat Incentive scheme.

We continue to work closely with our partners to manage local air quality in Carmarthenshire, including Natural Resources Wales, the Planning Authority, the Highways Authority, SWTRA and local schools.

Actions to Improve Air Quality

Air quality screening exercises were performed during 2021 at various locations and monitoring did not identify any breach of the Objectives. Further monitoring at other locations is being performed through 2022 and the results will be reported in the 2023 Progress Report.

A number of improvements have been delivered to improve air quality during 2021:

- **An Air Quality delivery plan** was developed and adopted.
- **A super-fast electric vehicle charging hub** located off the A48 at Cross Hands, we have installed a total of 43 electric charging points in the County.
- A significant programme of pedestrian and cycling infrastructure improvements.
- Work to improve our active travel network and engagement with residents has continued to help us improve our connectivity and infrastructure.
- **Wayfinding signage** to support active travel routes and visitors.
- **20mph zones** introduced across 9 Towns and villages, including Llanelli and Carmarthen.
- **Traffic Orders** prohibiting stopping outside the school gates
- The Brompton Electric Bike Hire Scheme introduced at Llanelli Station.
- **ECargo Bikes** – 12x ECargo bikes can now be loaned to local businesses to complete local deliveries and overcome challenges posed by traffic restrictions in town centres.
- **EBike Charging** – 5 x EBike Charging Stations have been installed at the Beacon, with more planned.
- **Cycle Parking** – new cycle parking was installed at 27 locations across Llanelli, Carmarthen and Ammanford.
- **Highway Improvements** – to Thomas Street Junction, Llanelli. The M4 corridor at Hendy.

Carmarthenshire also received several planning applications for new developments that carried out Air Quality Assessments, all of which stated that any impact would be negligible. Many other applications carried out a screening assessment and were able

to justify that no AQA was necessary. However, in support of the sustainable development principles of the Well-being of Future Generations (Wales) Act 2015 and Welsh Government policy guidance to reduce air pollution as far as possible, every opportunity is taken to implement measures to improve air quality through the development process. For example, by promoting the use of sustainable transport methods, with cycle parking, pedestrianised access routes, travel plans and the provision of Electric Vehicle infrastructure.

Local Priorities and Challenges

The Challenge for 2022 will be maintaining compliance against our Air Quality Objectives beyond 2021 and support the travel behavioural changes to sustain those improvements.

Work will continue in partnership to improve air quality under our Air Quality Deliver Plan. We continue to work closely with our partners to manage local air quality in Carmarthenshire, including Natural Resources Wales, the Planning Authority, the Highways Authority, SWTRA and local schools. The economy is in the stage of recovery, but uncertainty prevails in terms of the length of the recovery period given recent geopolitical and other influences. The Bank of England is also forecasting a two-year recession, so this may pose additional challenges.

We can see that much more work is needed promote a sustainable modal shift, as NO_2 levels can quickly return with increased traffic. The Welsh Government aspirations for Southwest Wales Metro and the need for investment to deliver modal shift to both Active Travel and Public Transport along with the development of the Regional Transport plans next year will also have a major influence on modal shift.

Whilst Local Authorities are not in control of the levers to effect modal shift, a substantial amount of work has been undertaken in developing Active Travel infrastructure and behavioural change interventions in the County and every major town has an active Travel Master Plan.

Priorities for the coming year in Carmarthenshire will focus on progressing the with the proposed actions for the Carmarthen and Llanelli AQMA's and working with Welsh Government and South Wales Trunk Road Agency to follow the progress of the Llandeilo Transport Study that includes the outstanding measures of the Action Plan for Llandeilo. Some key measures will include 20mph zones, wayfinding signs to help pedestrians

navigate, support for cyclists, more cycle parking, cycle repair stations, e-bike charging stations and promotion of E-cargo bikes for businesses to use in Towns. Improvements to footpaths. Traffic Orders restricting stopping outside schools with enforcement. Publication of an Electric Vehicle Strategy and Improvements to waste refuse routes and vehicles, with a general review of our fleet and progress towards the introduction of an electric T1 Carmarthen / Aberystwyth bus service.

Screening exercises will also be planned to monitor and assess the positive impact that should be brought by the Cross Hands Economic Link Road and further monitoring of NO_2 will be carried out in Carmarthen to ensure that any action plan work carried out does not move the problem to another location.

Where possible, efforts will be made to engage with schools located within our AQMA's to raise awareness of local air pollution and encourage active travel. It is planned to monitor levels of Nitrogen Dioxide around the school gates for schools within the County that are located within our AQMA Towns.

Following the COVID-19 pandemic much of our attention will be focussed on improving active travel routes, and support residents and visitors to travel sustainably and in a socially distance manner.

Carmarthenshire County Council recognises what can be achieved to improve air quality and the Pandemic has provided a best-case scenario, when non-essential travel is kept to a minimum. We also recognise that a number of Council' offices are based within our AQMA's and so efforts will be made to increase our own contribution towards improving air quality.

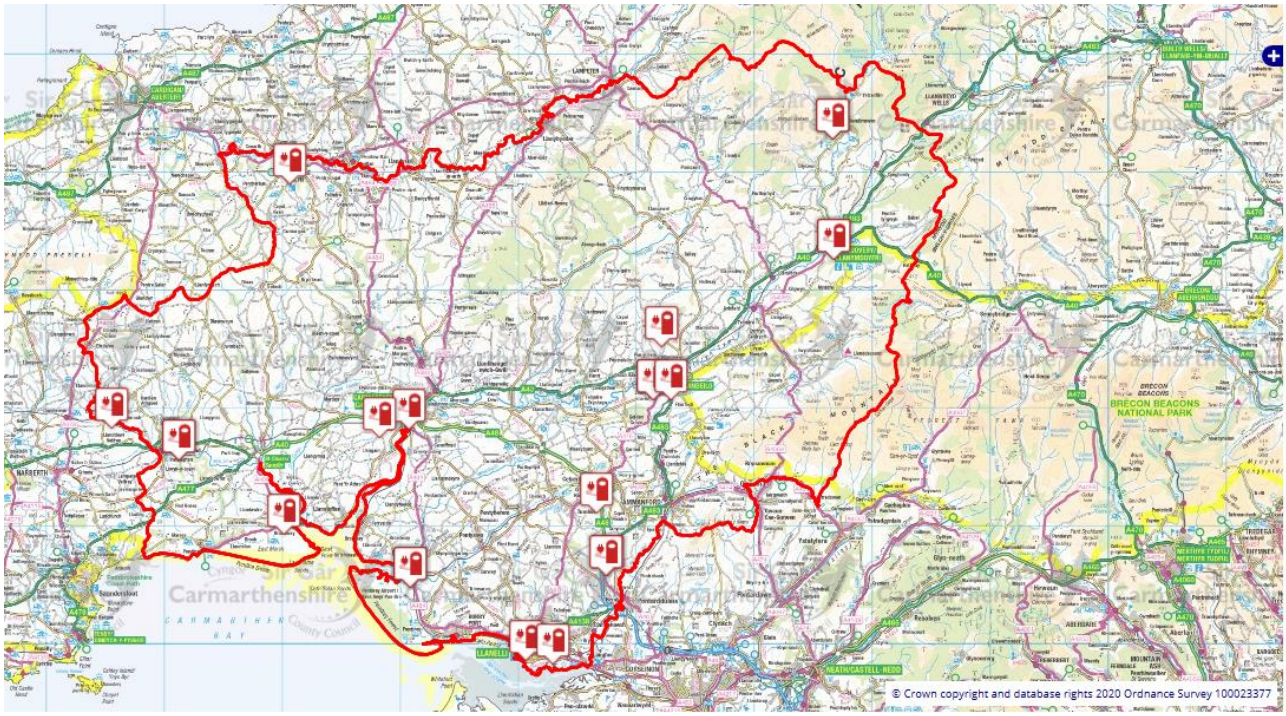
How to Get Involved

Air quality continues to be the largest environmental risk to public health, so there are many ways that you can help improve their local air quality in your area. Try reducing the use of cars for single person journeys, by car sharing, using other sustainable modes of transport such as electric vehicles and public transport, cycling or walking to work.

Rural residents can try Bwcabus – the Transportation Model for Rural Wales in Carmarthenshire providing access into neighbouring Powys and Ceredigion. The Bwcabus service enables people to travel between local towns and villages within the Bwcabus zone or connect to the main line bus services to travel further afield to places such as Aberaeron, Aberystwyth, Cardigan and Carmarthen.

Replacing your petrol or diesel vehicle with an electric car helps improve air quality and reduces emissions where you travel. There are also much more places available to charge an electric car in County and help plan your journey. Further information on electric vehicles, charging locations, and available grants can be found here.

Map of Electric Charging stations in Carmarthenshire car parks



77% of people in Carmarthenshire commute by car, 0.78% commute by bike and 9.5% commute by foot. Our aim is to see an increase in the number of commutes by bike and foot, so we encourage you to commute as much as possible through active travel.

If you would like to try out an electric bike or hire one for your commute you can hire an electric Brompton Bike from a Docking Station in Carmarthen Bus Station, Burry Port at the Seaview Terrace carpark or Llanelli Train Station. Further information on how to hire a bike can be found here:

https://www.bromptonbikehire.com/docks/3163-carmarthenbusstation
https://www.bromptonbikehire.com/docks/3164-carmarthenburryport
https://www.bromptonbikehire.com/docks/3165-llanelli

Travel more actively by getting involved in national walking and cycling weeks and make good use of the improved cycle routes across the Carmarthenshire. Improve pollution at the school gates by not idling car engines and improve walking and cycling routes for

schools by signing up to schemes such as living streets to encourage children to travel actively.

More information on active travelling such as finding a cycle route/ footpath or public right of way is available in our active travel webpage.

Anyone can all get involved on National Clean Air Day, and participate in a global effort to make the air cleaner and healthier for everyone, Find out more on https://www.cleanairday.org.uk/wales

For further information on air quality within Carmarthenshire please visit:

https://www.carmarthenshire.gov.wales/home/council-services/environmental-health/air-quality/#.W46Mg-mQzIU

Or contact 01267 234567

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1 Actions to Improve Air Quality

1.1 Previous Work in Relation to Air Quality

Carmarthenshire County Council's first Air Quality Review and Assessment went to consultation in draft form during the summer of 2001. Assessment was made with reference to the Air Quality Regulations 2000. Only sulphur dioxide and nitrogen dioxide were identified in the Stage 1 assessment as requiring a Stage 2 assessment. The Draft Review concluded that a 3rd stage assessment was not necessary for any pollutant.

In response to consultation comments received from the National Assembly for Wales in respect of nitrogen dioxide levels from road traffic, Carmarthenshire County Council commissioned consultants to undertake a 3rd stage Review and Assessment in respect of nitrogen dioxide levels from road traffic along a particular route.

The final report of the 3rd stage review and assessment was produced in March 2002 and concluded that it was unlikely that nitrogen dioxide levels from road traffic sources would exceed objectives and that there was no need at that time to declare an Air Quality Management Area. It was considered, however, that for future assessments further investigation of street canyon effects would be advisable.

An Updating and Screening Assessment was started in 2003 and submitted to the Welsh Assembly Government in 2004. A number of conclusions were reached but progress on any of the recommendations was delayed until confirmation of guidance. Prioritisation of workloads within Carmarthenshire County Council meant that no further formal documentation was produced until the next Updating and Screening Assessment.

An Updating and Screening Assessment was undertaken in 2006, which included the Progress Report for 2005 (submitted to the Welsh Assembly Government in 2007) and concluded that there was no need to progress to a Detailed Assessment for carbon monoxide, benzene, 1,3 butadiene, lead, nitrogen dioxide, sulphur dioxide or PM_{10}. However, the report concluded that a nitrogen dioxide co-location study was needed to validate the results. Also, to reduce the potential for public exposure of sulphur dioxide at the Gwili Railway Station, the Public Protection Department of Carmarthenshire County Council needed to work with the management of the railway company. This has been on-

going with a work instruction relating to the idling time of steam engines to be less than 15 minutes when alongside the platform.

The original 2008 Progress Report that was submitted to the Welsh Assembly Government concluded that there had been an increase in the number of tube sites that had exceeded the annual objective. In total, eight sites had failed to meet the objective which was more than expected and had been predicted. It was noted that there was a significant change in the tube bias adjustment figure used compared to the previous couple of years. The figure was 0.90.

However, after submission of the report the authority received correspondence from the Welsh Assembly Government that detailed the latest bias adjustment figure had been reviewed and subsequently changed to 0.77. Also, that using the new "NO_2 with Distance from Roads" tool effectively reduced the number of tube sites that failed to meet the annual mean objective. The 2008 report was amended internally to reflect the changes and provide accurate historical information. The net result of this was that only one relevant tube location was identified as exceeding the air quality objective.

The Updating and Screening Assessment 2009 identified the need to proceed to a Detailed Assessment for NO_2 in Llandeilo, based on the annual mean objective of 40µg/m^3 being exceeded for the last two years and that work on the proposed relief road was not likely to begin for at least the next five years. The USA also recommended a full review of the diffusion tube network and assessments for the additional criteria detailed in Technical Guidance (09).

The Progress Report 2010 provided details of the Detailed Assessment that had been set up in Llandeilo, along with providing information on how the diffusion tube network had changed following the review in 2009. Further reviews of the tube network were recommended.

The Llandeilo Detailed Assessment Report 2010 was submitted and accepted by the Welsh Assembly Government in 2010. The report concluded that a public consultation should begin for the proposed designation of an Air Quality Management Area within the town and that a Further Assessment should follow on from the Detailed Assessment. The consultation took place and an Air Quality Management Area Order declared in November 2011.

The Progress Report 2011 provided further details for modifications to the diffusion tube network and proposals for the potential Detailed Assessments that may be required for the towns of Carmarthen and Llanelli.

The 2012 Updating & Screening Assessment Report reviewed the work in Llandeilo since the designation of the AQMA. It reported that an Action Plan was to be developed and this would be achieved by setting up a Steering Group and Action Planning Group. The Action Plan was due to be submitted later in 2013. Included in the USA were the proposal reports for the Detailed Assessments that were to be carried out for the towns of Carmarthen and Llanelli, along with details of further modifications that had taken place with respect to the diffusion tube network in the rest of the county.

The Llandeilo Further Assessment Report was submitted and concluded that the authority was justified in designating an AQMA for the town and that the boundary of the AQMA was appropriate. Source apportionment work was carried out and the necessary reduction in NO_2 identified. The results from the Further Assessment work were used to assist the development of the Action Plan.

Detailed Assessment Reports for the towns of Carmarthen and Llanelli were submitted and concluded that the monitoring results had not identified the area of exceedance and that more work was needed to identify potential boundaries. Modifications to the Detailed Assessment monitoring networks for both towns were proposed and implemented from January 2013.

The modified Detailed Assessments continued through 2013 for both towns and a review of results established that the areas of exceedance were very localised and likely to be attributable to the location characteristics. Reports for both extended Detailed Assessments were submitted in February 2014 and the conclusions and recommendations accepted by Welsh Government.

Work on the Llandeilo AQMA continued through 2013 with a draft Action Plan being developed encompassing feedback from various stakeholders and a Report of the work, along with the proposals in the draft Action Plan being put out to public consultation in September 2013. Drop-in centres were set up in two locations (Ffairfach and Llandeilo) over a two-week period and comments received during the consultation have been used to review the draft Action Plan. The Llandeilo AQMA Boundary map can be found in Appendix D: AQMA Boundary Maps.

In 2014 the Action Plan was finalised and published with work continuing the Phase 1 proposals. The designation process for the AQMA's in the towns of Carmarthen and Llanelli also begun with reports being submitted to the various council committees for approval. Whilst it had been hoped to have the Orders issued by the end of 2015, work commitments meant this was not possible.

The 2015 Updating and Screening Assessment was submitted and accepted.

Work on designating the AQMA's for Carmarthen and Llanelli continued in 2016 with the Orders being signed and issued on the 2nd August 2016. The Llanelli and Carmarthen AQMA Boundary maps can be found in Appendix D. Subsequent Action Plans for both Carmarthen and Llanelli were drafted in 2017 encompassing feedback from various stakeholders. A report of the work along with the proposals in the draft Action Plan were then put out to public consultation in July 2017 until September 2017, comments received during the consultation were used to review the draft Action Plan and a report was submitted to Welsh Government in December 2017.

Improvements were made to the Action Plans incorporating feedback from Welsh Government appraisal, the revised plan was then consulted with stakeholders from the action plan steering group in July 2018 and included in the 2018 Annual Progress Report. The final Action Plan for Llanelli and Carmarthen was submitted to Welsh Government for approval December 2019. Progress with the Action Plans has been reported in the annual progress reports.

The Action Plan for Llandeilo AQMA was planned for 2020, however delayed and postponed with the Covid19 pandemic. It is planned to conduct this review in 2022.

Table 1.1 – Summary of LAQM Reporting

Air Quality Report	**Submitted**
1st Air Quality Review (2001)	2002
Updating & Screening Assessment (2003)	2004
Progress Report (2005)	2007
Updating & Screening Assessment (2006)	2007
Progress Report (2008)	2008

Updating & Screening Assessment (2009)	2009
Progress Report (2010)	2010
Llandeilo Detailed Assessment (2010)	2010
Progress Report (2011)	2011
AQMA Declaration (Llandeilo) (11/11/11)	2011
Updating & Screening Assessment (2012)	2012
Llandeilo Further Assessment (2012)	2012
Carmarthen Detailed Assessment (December 2012) + appended Modified DA Network Report (for January 2013)	2013
Llanelli Detailed Assessment (December 2012) + appended Modified DA Network Report (for January 2013)	2013
Progress Report (2013)	2013
Draft Action Plan Report for Llandeilo (Public Consultation)	2013
Extended Detailed Assessment Report for Carmarthen	2014
Extended Detailed Assessment Report for Llanelli	2014
Llandeilo Action Plan Report	2014
Llandeilo Action Plan	2014
Progress Report (2014)	2014
Updating & Screening Assessment (2015)	2015
Llandeilo Action Plan First Review (2016)	2016
Progress Report (2016)	2016
AQMA Declaration (Carmarthen and Llanelli) (02/08/16)	2016
Carmarthenshire AQ Screening Review Report (2016)	2017
Llandeilo Action Plan Second Year Review (2016)	2017
Carmarthen and Llanelli Draft Action Plan report	2017
Progress report (2017)	2018

Carmarthenshire AQ Screening Review Report (2017)	2018
Llandeilo Action Plan Third Review Feasibility of Phase 1 outstanding options (2017)	2018
Annual Progress report (2018)	2019
Carmarthenshire AQ Screening Review Report (2018)	2019
Llandeilo Action Plan fourth year review (2018)	2019
Final Action Plan for Carmarthen and Llanelli AQMA's	2019
Annual Progress report (2019)	2020
Annual Progress Report (2020)	2021
Annual Progress Report (2021)	2022

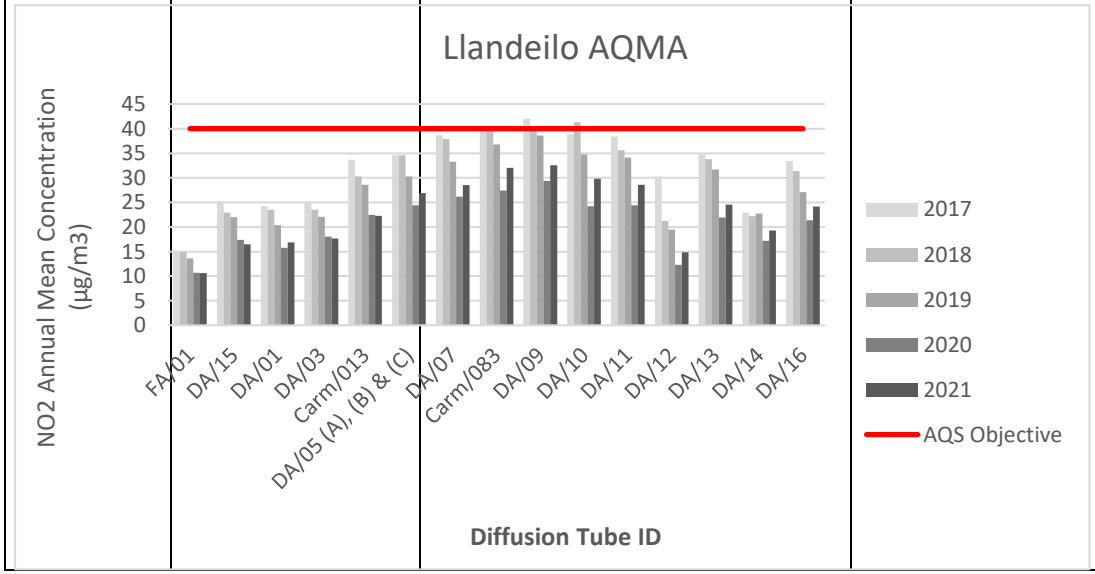
1.2 Air Quality Management Areas

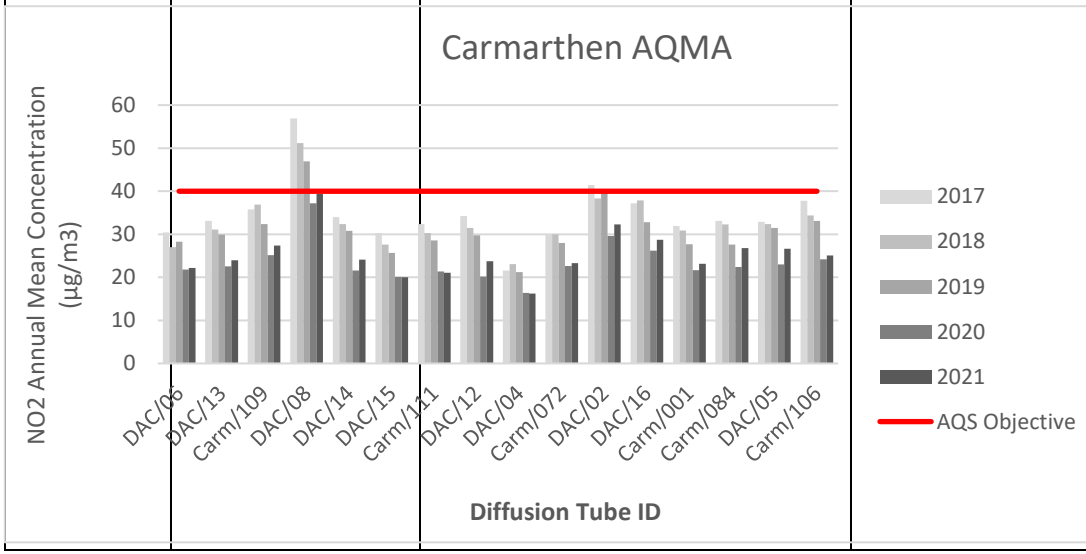
Air Quality Management Areas (AQMAs) are declared when air quality is close to or above an acceptable level of pollution (known as the air quality objective (Please see Appendix A)). After declaring an AQMA the authority must prepare an Air Quality Action Plan (AQAP) within 18 months setting out measures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

A summary of AQMAs declared by Carmarthenshire County Council can be found in Table 1.2. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=395 see full list at AQMA webpage.

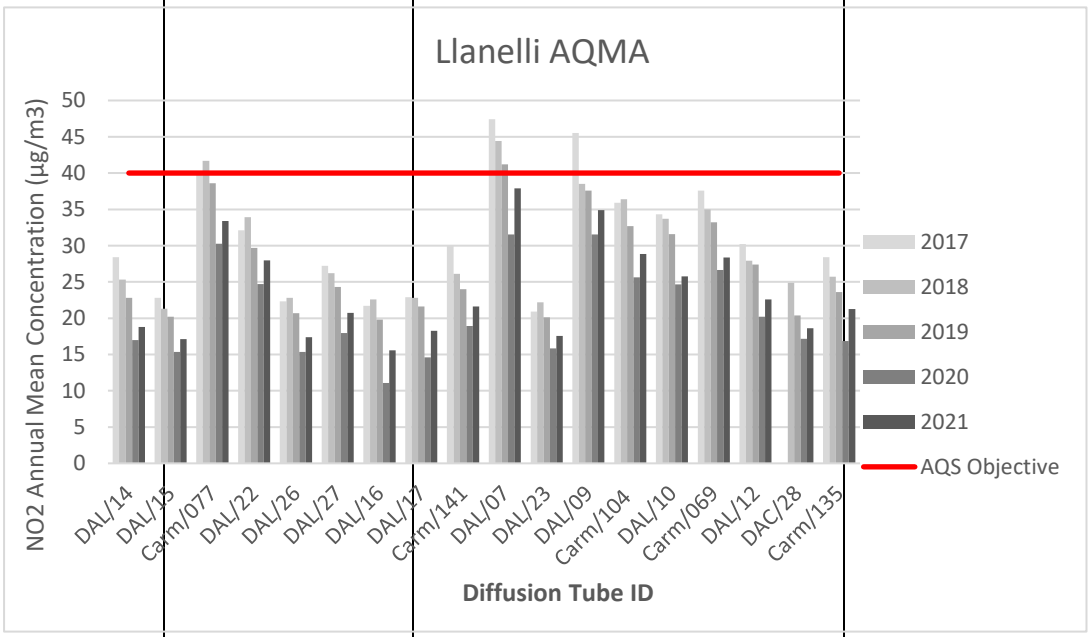
Table 1.2 – Declared Air Quality Management Areas

AQMA	Relevant Air Quality Objective(s)	Comments on Air Quality Trend	Town	Description	Action Plan
	NO_2 annual mean	This year's monitoring results indicates a significant improvement in air quality compared to previous three pre-Covid years. Although there has been an increase in NO_2 compared to 2020. No exceedances are reported for the third year running.	Llandeilo	The length of the A483 from the roundabout junction of A483 with A476 Ffairfach north along Towy Terrace across Llandeilo Bridge into Bridge St then Rhosmaen St through the town centre until the roundabout junction of the A483 with the A40.	Llandeilo AQMA Action Plan



AQMA	Relevant Air Quality Objective(s)	Comments on Air Quality Trend	Town	Description	Action Plan
AQMA Carmarthen	NO_2 annual mean	This year's monitoring results indicates a significant improvement in air quality compared to previous pre-Covid years. However, 2021 has seen a marginal increase in NO_2 across most of the AQMA in comparison to 2020. The most noticeable improvement is observed at DAC/08, however it continues to observe the highest levels in Carmarthen.	Carmarthen	The designated area incorporates the Jobs Well Road junction on the B4312 in Johnstown and travels in an easterly direction up Monument Hill and down Picton Terrace to meet the St Catherine's Street roundabout. It continues along St Catherine's Street, spurring north up Water Street to the junction with Glannant Road and Pentrefelin Street, on to Barn Road and Francis Terrace and continuing to Richmond Terrace before bearing right along Old Oak Lane and reaching Old Oak roundabout. The boundary spurs east along Priory Street, through Abbey Mead and as far as Tanerdy roundabout on the A484, being the eastern extent of the AQMA. At Old Oak roundabout the boundary also spurs right along Priory Street and through Church Street, Spilman Street and on to the junction on the A484 below County Hall. The boundary travels south over Towy Bridge	Carmarthen AQMA Action Plan
					

AQMA	Relevant Air Quality Objective(s)	Comments on Air Quality Trend	Town	Description	Action Plan
				as far as the Towy Bridge roundabout, which is the southern extent of the AQMA. From the junction below County Hall the boundary travels west along Coracle Way and on to Morfa roundabout before heading north up Morfa Lane to meet up with St Catherine's Street roundabout and then heads west back to the Jobs Well Road junction completing the AQMA boundary.	
AQMA Llanelli	NO_2 annual mean	This year's monitoring results indicates a significant improvement in air quality compared to the previous pre-Covid years, although 2021 has seen an increase in NO_2 in the AQMA in comparison to 2020. Overall, there is a noticeable downward trend since 2018.	Llanelli	The designated area starts from the section of the A484 known as Bassett Terrace from the far west at the junction with Waun Eos Road travelling easterly through Sandy Road and incorporating Sandy Road roundabout, continues to follow an easterly direction along the A484 Pembrey Road before turning north up New Road as far as the mini round-about in Furnace, and then travels back south along Old Road as far as the junction with Thomas Street on the A476.	Llanelli AQMA Action Plan

AQMA	Relevant Air Quality Objective(s)	Comments on Air Quality Trend	Town	Description	Action Plan
				The boundary then travels north east along the A476 through Felinfoel Road and Panteg, as far as the mini roundabout joining Farmers Row. The boundary travels back south west along the A476 right down to Thomas Street bearing left along the A484 continuing on to the roundabout and bearing right following the A4214 along Stepney Place. The boundary continues along the series of mini roundabouts going through Upper Robinson Street and Murray Street before turning right at the junction with Station Road. The boundary continues along the A4214 through Church Street, Hall Street, West End on to Pembrey Road, again incorporating Sandy Road roundabout before travelling back west along Sandy Road and on through Bassett Terrace before completing the boundary at the far west junction with Waun Eos Road.	

AQMA boundary maps within Carmarthenshire can be viewed at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=395 and are included in Appendix D.

1.3 Implementation of Action Plans

Carmarthenshire County Council has taken forward a number of measures during 2021 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 1.3. More detail on these measures can be found in the Air Quality Action Plan relating to any designated AQMAs.

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

Key completed measures completed in 2021 are:

- **An Air Quality delivery plan** was developed and adopted with stakeholders to encompass the outstanding actions of our current AQAP's for Llanelli, Carmarthen and Llandeilo, whilst reviewing the current measures to reflect updated needs and objectives, particularly in light of the recent pandemic, changes in behaviours and a stronger focus on promoting a sustainable modal shift, not only targeting our AQMA's but across the County.
- **Electric Vehicle Charging Points** - 43 electric vehicle charging points have been introduced in Carmarthenshire County Council owned carparks. Furthermore, Carmarthenshire Council secured £370,000 via the Ultra-Low Emission Vehicle Transformation Fund by Welsh Government and installed a super-fast charging hub located off the A48 at Cross Hands, which provides four 50KW rapid chargers and one 150KW rapid charger . This was completed in 2021 and believed to be the first of its kind in Wales. Cross Hands is not located within an AQMA, however it is a key connection point between the towns of Llanelli, Carmarthen and Ammanford.
- Works to a new path along Llansteffan Road, Picton Hill and Picton Terrace have been completed, this builds on the Active Travel routes developed for key linkages to Carmarthen Town Centre.
- A footway was widened across Sandy Bridge (Pembrey Rd), Llanelli. The carriageway was narrowed to achieve this.
- **Traffic Orders** prohibiting stopping outside the school gates at certain times are proposed at several schools across the county.

- **School gate parking prohibitions** have been improved in areas including Llanelli and Ammanford with further improvements continuing and enforcement being undertaken by camera car.
- Carmarthenshire introduced the County's first **School Street**, where vehicles are restricted access during start and finish times, using WG Road Safety Grant. Two school streets are being implemented and promoted; at Elkington Park, Bury Port and Morfa School, Llanelli. This prevents traffic accessing school entrance (via residential area) only residents have access, enforced by ANPR cameras.
- **ECargo Bikes** – 12x ECargo bikes have been purchased using Local Sustainable Transport Covid Relief Fund (LSTCRF), to be loaned to local businesses to complete local deliveries and overcome challenges posed by traffic restrictions in town centres.
- **EBike Charging** – 5 x EBike Charging Stations (each with 5 chargers) have been installed at The Beacon to support Active Travel journeys for people working out of the building.
- **Brompton Bike Hire –** An additional docking station is located at Llanelli Train Station.
- **Wayfinding** – Walking/Cycling wayfinding signage have been installed across 13 towns in Carmarthenshire (incl Carmarthen, Llanelli and Llandeilo) providing directions from public transport stops/stations to key trip attractors (to facilitate first and final mile of more sustainable journeys). Undertaking using Local Transport Network Fund (LTNF) and LSTCRF.
- **Cycle Parking** – new cycle parking was installed at 27 locations across Llanelli, Carmarthen and Ammanford. Purchased using LSTCRF following consultation using Active Travel Fund (ATF). Additional cycle parking purchased and installed at Leisure Centres across the county utilising LSTCRF too.
- **Public Cycle Repair Stations** – small units including a bike pump and various tools to undertake minor repairs on a bike whilst out in public. We have purchased 20 units using LSTCRF to be installed across the county during 2021 using Active Travel Fund.
- **20mph Zones** – Delivered across 9 towns/villages using LSTCRF/RSG funding. Carmarthen and Llanelli works have been completed including Blue Street and Mansel Street in Carmarthen, and Llanelli (North).
- **Hybrid/Agile working** - The interventions necessary during the Covid pandemic helped stimulate a change to the way we work through the use of technology. Post Covid the transition to agile working has continued to reduce the need for travel. The Authority has an approved Agile working policy.

- **Green Infrastructure Strategy** – Three stakeholder events were held in November 2021 to consult on greening 8 towns in Carmarthenshire, to help inform the development of a strategy.

- Further work will also be conducted to monitor progress of delivering the outstanding intervention proposals of the Llandeilo Action Plan in conjunction with the A483: Llandeilo and Ffairfach Transport Study, commissioned by Welsh Government. The remaining actions are under consideration within this study. Following the consultation, of WeITAG Stage Two, the Independent Review Panel will consider all of the feedback and will recommend a preferred option to Welsh Government for a Welsh Ministerial decision on a final recommendation which has been delayed to the end of 2022.

- It was planned to review the Llandeilo action plan during 2020, however the COVID19 Pandemic has unfortunately delayed this progress. There is a significant overlap in the options considered in the Welsh Government Llandeilo Transport Study with the measures proposed in the Action Plan, so it is prudent to review the action plan work in parallel. This was postponed to 2021, however as no further progress has been updated since the latest consultation, it is now planned to review this once further decisions will be announced on the preferred delivery options.

Highway Improvements

- Road Safety Improvements were made to the Thomas Arms Junction from Thomas Street to Old Road in Llanelli to support safe pedestrian crossing in Lower Felinfoel Road and improvements to the bus stop at Thomas Street. This included widening of the footways, removing the northbound left-hand turn which would prevent parked/idling vehicles next to the receptors and therefore move traffic further away. Work was completed August 2021.

- The Welsh Government and Carmarthen County Council commissioned and completed works to upgrade the existing M4 J48. The proposed works included:
  - Carriageway widening to increase the capacity of the A4138.
  - Renewal of the existing traffic signals on the M4 westbound off-slip and Tal-y-Coed junctions, to improve the safety of traffic movements and reduce queues.
  - Lane management measures on the A4138 southbound to maximise the capacity of the existing carriageway.

- Improvements of all the M4 junctions with the A4138
- Provision of a shared use facility to tie into the route recently constructed between the A4138 and Llangennech.

The works were completed December 2021.

- Work was commissioned by Welsh Government to introduce signalised traffic lights at Ffairfach Square near Llandeilo at the boundary of the Llandeilo AQMA in replacement of the roundabout. The scheme is being implemented to address an existing concern with the safety of pedestrians in the area, particularly school age pedestrians accessing the educational establishments in the area. An Air Quality assessment for the proposed works, expect that that the traffic signals will increase congestion slightly but concluded that it would unlikely have a significant impact on Air Quality due to levels being significantly below the Air Quality Objective. This will be monitored and verified and NO_2 diffusion tubes have been set up in 2021 to assess the impact. Works finished in 2021.
- Construction of the Cross Hands Economic Link Road will continue – derived from the transformational project at the Cross Hands Growth Zone, a 3-phased transport project opening up access to key strategic employment sites and the wider Cross Hands area including Penygroes and the Gwendraeth Valley. This work should be completed in 2022.
- In Llanelli, Traffic flows freely during large periods of the day but during peak periods traffic volumes spike leading to congestion on key routes and junctions. The town centre along with its A484 and A476 approaches form part of the Llanelli Air Quality Management Area (AQMA). Options to improve the A484 and A4138 have were developed in 2021 with work progressing to determine preferred schemes.
- The development of an Electric Vehicle Strategy was planned for 2020, however progress on this was postponed pending the outcome of the Welsh Government EV Strategy. This is under development in 2021. We will report the progress of this in the next report.

- **Rural Connectivity** – connectivity to the County's market towns and rural conurbations is critical to the lifeblood of Carmarthenshire. Collaboration with Traveline Cymru and other key stakeholders will ensure the continuation of Bwcabus – the Transportation Model for Rural Wales in Carmarthenshire providing access into neighbouring Powys and Ceredigion. The Bwcabus service enables people to travel between local towns and

villages within the Bwcabus zone or connect to the main line bus services to travel further afield to places such as Aberaeron, Aberystwyth, Cardigan and Carmarthen.

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

- **Electric Vehicle Strategy** for the County is under development and should be published in 2022.
- **EBike Charging** – A further 8 E-bike Charging Stations will be installed across county.
- **E- Cargo Bikes** - Bikes have been acquired and a Comms plan has been arranged to promote the scheme. A unit will be deployed through Llanelli BID. This will be an ongoing area of work to stimulate uptake and support businesses through recovery.
- **Bike Hire Schemes** – Further work continues to support the development of bike hire schemes as part of the Authority's Cycle Strategy.
- **Cycle parking** - New cycle parking proposed at 27 locations in Llanelli, Carmarthen Ammanford and Leisure centres. 20 cycle repair Units to be installed across main towns of the County. Sheltered Cycle Parking to be installed at Carmarthen Leisure Centre, Carmarthen Market and Ammanford Quay Street in November 2022.
- A Carmarthen masterplan has been created to look at increasing the amount of active travel links throughout the town. Feasibility studies are underway.
- **20mph** – Welsh Government legislation is being introduced in September 2023 which will reduce the speed limit on residential streets from 30mph to 20 mph. Preparations are currently underway for this change in legislation and implementation of a 20mph default speed limit by September 2023.
- **Improvements to bin collections & road sweeping** - The new routes will be routed in order to make them more efficient, move to zonal working, reducing the need for vehicles to be traveling across the whole county on any given day.
- Comprehensive **modelling work and feasibility studies** have been undertaken to evaluate options to improve the A484 congestion, Llanelli. The options have been subject to consultation with stakeholders. Overall, there was support for infrastructure improvements. The work formed part of a wider study for infrastructure in Llanelli which was subject to the Roads Review. The outcome of the roads review is awaited, in the interim work has commenced to promote Active

Travel with schools in the area. The interventions will support improved reliability of public transport.

- **Footpath improvements** – work is planned to improve active travel routes and shared footpaths following the active travel consultation responses to improve active travel connectivity.
- The **T1 Carmarthen / Aberystwyth bus service** in process of transitioning to an electric fleet. In progress to deliver T1 electric bus by February 2023 in partnership with the Welsh Government and Transport for Wales.
- Impacts from the Carmarthen Western Link Road will be monitored and assessed. Diffusion tubes are located on the alternative route (old St Clears Road& Jobs Well Road) travelling through the Carmarthen AQMA, to identify whether there has been a reduction of traffic and subsequent NO2 along these roads. Along with College Street so that we can identify whether the link road has resulted in any increase in traffic and pollution travelling through this area. It was not felt that 2020 and 2021 data provided a true representation of any impacts this link road has made.

Table 1.3 – Progress on Measures to Improve Air Quality

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
	CARMARTHEN **High Priority**										
C1	Improve cycle routes in and around the town.	Provide alternative to car journey	County Council	2018	2018 – 2022	Usage of cycle routes by counter	0.1%	Safer routes in Communities (Johnstown) Cycle routes advertised on website. First section of Tywi Valley Cycle path opened New Shared Use path along Llansteffan Rd, Picton Hill and Picton Terrace constructed by end of 20/21 Masterplan being scoped for the town as well as active travel consultation currently live	Tywi Valley Path succesful in receving leveling up funding £16.7 million for it's creation Works have now been completed along identified areas. A Carmarthen masterplan has been created to look at increasing the amount of active travel links throughout the town.	SUP by 2021 2022 Action ongoing	Impossible to identify reduction in emissions

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
C3	Improve car parking issues at Glangwili Hospital.	Reduce congestion on and around the site	Local Health Board / County Council	2017	2018	Reduced congestion / traffic counts	1%	Cycle space compound, Additional parking spaces and promotes use of park and ride scheme. Car park Management contract started Sept 2018, APNR enforcement started August 2019.	Carpark Capacity reduced (loss of 32 spaces). Increased demand from contractors on site. Looking to increase parking provision by 64. Agile working and Telemedicine helped to reduce appointments and demand for parking.	May 2022	Impossible to identify reduction in emissions
C6	Review the Park & Ride provision for the town.	Improve service and increase uptake	County Council / Partners	2019-2020	2020 - 2022	Usage data / monitoring data	0.5%	Timings of P&R reviewed and improved to support hospital staff Staff uptake of park and ride increased in 2019. P&R service increased its operational hours from 7am – 7pm to 6am – 9pm to support shift workers Jan 2020.	Service is currently under review. Patronage is very low, with many of the users having access to alternative services. Ongoing driver shortages resulting in some lost journeys, with operator considering future ability to provide the service. Due for cyclic retender in 2024 Service continues to be promoted by Hywel Dda Board	ongoing	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
C7	Introduce a 20mph speed limit in the town (possibly part time)	Reduce emissions, improve road safety, less congestion, encourage walking, improve health	County Council	2018	2018 - 2019	Monitoring data	1%	20mph zones introduced around schools and shopping areas Additional 20mph areas Area wide in Carmarthen - complete	Welsh Government legislation is being introduced in September 2023 which will reduce streetlit residential roads from 30mph to 20 mph. Preparations are currently underway for this change in legislation.	2023	Too early to identify reduction in emissions
~~C 13~~	Review pedestrianisation across town and extend it.	Improve where possible and reduce emissions	County Council	2016	2020 -	Area coverage	?	Consultation carried out for King Street , Consideration to part time pedestrianisation of shopping areas	Temporary Restrictions in Town Centre to support social distancing during 2020. Restrictions removed following review. Regeneration Forums have since been established in principal towns to explore opportunities and options including streetscape options.	Started August 2020	
	Medium -High Priority										

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
C2	Promote use of Carmarthen by-pass ~~through media resources.~~	Reduce number of vehicles travelling through town unnecessarily	County Council	~~2019~~ 2021	2022	Traffic counts	0.5%	Signage in place directing Hospital traffic to use bypass not Town Centre.	Carmarthen Town Feasibility Study being prepared for the Regeneration Forum which includes consideration of traffic signs.	TBC	
C4	Install AQMA signage (suggest alternative routes?).	Reduce number of vehicles travelling through AQMA unnecessarily	County Council / SWTRA / WG	2019	TBC	Traffic counts	1%	None	Explored options for AQMA signage	?	Improvements may be identified through monitoring results
C5	Assess positive / negative impacts of Western Link once opened.	Reduce congestion, improve traffic flow, reduce emissions	County Council	2018	2019	Traffic counts / monitoring data	3%	Western Link construction completed	Western Link Road opened March 2019	~~2020~~ 2022	
	Medium Priority										

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
C8	Promote more car sharing / dedicated car parks (involve supermarkets?)	Reduced vehicles trips	County Council / Partners	2018	2019	Use of car sharing spaces?	0.1%	Promotion of car share website. Dedicated parking through planning . Travel Plans have been introduced in schools. A lift sharing app for parents was being developed. Car sharing promotion has been paused during COVID	Car share through Liftshare.com promoted to staff	Ongoing Await outcome of covid travel impacts	Impossible to identify reduction in emissions Difficult to monitor uptake
~~C 11~~	Investigate bike hire scheme for the town.	Reduced vehicle trips	County Council / Partners	2018-2019	2020	Uptake of bike hire	0.1%	Bike Hire in Carmarthen Park	Brompton Bike Hire Docks Installed in Blue Street, Carmarthen, next to the bus station	Jan 2021	Impossible to identify reduction in emissions
	Medium-Low Priority										
C 10	Introduce electric/low emission buses, and introduce smaller buses at off-peak times.	Emissions reduction	County Council / Bus Operators	2019	TBC	Change in bus fleet	1%	Unsuccessful application for electric bus bid for the park and Ride scheme.	Work in progress for introduce an electric T1 service From Aberystwyth to Carmarthen by end of 2022 in partnership with WG and transport for Wales.	On going	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
~~C9~~	Johnstown bridge scheme feasibility study.	Reduce traffic congestion and emissions on Llansteffan Road, and relieve congestion on connecting routes	County Council / SWTRA / WG	2019	2020	Traffic counts / monitoring data	2%	Scheme planned to improve traffic flows on Llansteffan Rd.	Consideration to slip road improvements A40 Carmarthen to St Clears WeITAG Stage one report completed Nov 2020	2019	
	LLANELLI **High Priority**										
~~L1~~	Assess traffic light sequencing for Thomas Street/Gelli Onn junction.	Reduced / displaced congestion	County Council	2017	2019	Traffic counts / monitoring data	5%	Monitoring in place to help inform source apportionment	Real-time indicative monitoring project in collaboration with Swansea University	2019	This project formed part of a wider collaboration with Swansea University on Action Planning interventions

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
L5	Introduce a 20mph speed limit in the town (possibly part time)	Reduce emissions, improve road safety, less congestion, encourage walking, improve health	County Council	2018 2020	2019 – 2020 2021	Monitoring data	1%	Safe routes in Communities Fund -20mph zones introduced around schools and some others areas	Additional zones in place Part of 3 year project Further projects for Llanelli north and south areas will introduce 20mph with 5-year AQ monitoring with WG funding	2021 2022 - 2026	Too early to identify reduction in emissions

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
L9	Improve footpath / cycle route connectivity for the Sandy Road area.	Provide alternative to car journey	County Council	2018	2019 - 2021	Usage of cycle routes by counter	0.1%	Local Transport Fund/Active Travel Fund Plans designed, improvements made and ongoing	Footway widening across Sandy Bridge (Pembrey Rd) to be complete by Summer 2021. Carriageway narrowed to achieve this. Wider active travel network being developed Sandy Road and its junctions are currently under review. Adjoining active travel routes have been improved via Safe Routes in Communities funding e.g. ramped access to Sandpiper Road	2021	Impossible to identify reduction in emissions
~~L11~~	Determine opportunities from the Wellbeing Village development.	Sustainable travel, travel plan, EV charging etc.	County Council / Partners	2018	2019	Implementation of alternative travel options	?	Use of policy guidance to reduce pollution impact from development	Outline Planning consent granted, signage strategy and travel plan conditioned.	2023	
	Medium-HIgh Priority										

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
L3	Install AQMA signage (suggest alternative routes?).	Reduce number of vehicles travelling through AQMA unnecessarily	County Council / SWTRA / WG	2018-19	2020	Traffic counts	1%	None	Explored signage options	2022	Improvements may be identified through monitoring results
L4	Promote use of Coast road through media resources.	Reduce number of vehicles travelling through town unnecessarily	County Council	2018 - 2019	2020 - 22	Traffic counts	0.5%	None	Signage Strategy planned as part of Traffic modelling study for the Town		

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
~~L6~~	Review the Park & Ride provision for the town.	Improve service and increase uptake	County Council / Partners	2019	2020 - 21	Usage data / monitoring data	0.5%	P&R currently operated for Parc Y Scarlets match days No current demand, currently low-cost parking available within AQMA No options currently being actively developed, Active Travel network being developed, covid will influence travel behaviours	Llanelli has a good bus transport network to support movement into the town. Improved real time information at bus stations/ stops and links to active travel network and metro project. The option for a park and ride service in Llanelli is not considered operationally or financially feasible		Impossible to identify reduction in emissions
~~L8~~	Feasibility study for a by-pass for Sandy Road.	Reduce congestion	County Council	2018	2020 - 2021	N/A	2%	Options under consideration with Sandy Road Corridor Improvements but Significant constraints and high costs	These options have been discarded due to significant environmental, social and cost constraints	2021 Rejected	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
~~L16~~	Assess parking in and around Pentip School.	Reduce congestion, improve road safety	County Council	2018	2019	Options to promote active travel	0.5%	Limited parking for permit holders only	Improvements to footways and waiting shelter, action complete	2021	
~~L17~~	Feasibility study for weight and speed restrictions on Pembrey-Road.	Reduce emissions, improve road safety	County Council	2019	TBC	Monitoring results	0.5%	Monitoring started in conjunction with school project	This has been rejected, Advisory 20mph at Pentip school, speed is already low on this road. Weight restrictions are not practicable	2021	
~~L10~~	Determine impacts / opportunities from the Graig College development.	Traffic flow, congestion, pollution	County Council / Graig Campus	2019	2020	Changes in traffic flow, congestion	?	Planning reviewed	Planned as part of a traffic modelling study for the Town All access via A484 West Llanelli be captured in a single action. Note options currently being considered	2021	
~~L20~~	Feasibility study for using Stradey Park Avenue for school start and finish times only.	Reduce congestion on Sandy Road and area.	County Council	2021	TBC	Traffic counts and monitoring results	0.5%	None (Link with L9)	Not being considered by CCC general review of county school access during start and finish times planned for 2021	Measure rejected	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
~~L21~~	Feasibility study for creating a one-way system for Sandy Road with traffic flow from the west only along Sandy Road and traffic flow east using Sandpiper Road off Sandy Roundabout and re-join at Sandy Water Park roundabout.	Reduce congestion, reduce emissions and improve road safety	County Council	2019	2020	Traffic counts and monitoring results	1%	No through traffic currently available on Sandpiper Road.	Traffic modelling study planned for Llanelli Town, (consideration to be given to a bus only link between Sandpiper Rd and Sandy Road) Rejected as standalone item, to be considered as part of improvements to reduce congestion via A484 Sandy Road Corridor)	2021	
Replaces L10, L20 and L21	Consider sustainable options to reduce congestion via A484, Llanelli West (Sandy Road Corridor) encouraging sustainable modal shifts	Strategi Highway Improvements UTC, congestion management, traffic reduction	County Council	2019		Traffic counts Changes in traffic flow, congestion monitoring data		Application to WG to fund improvements	Consultation on Sandy Road Corridor Improvements carried out 2021 following comprehensive feasibility and modelling studies on options to reduce congestion	Options subject to WG funding	
	Medium Priority										

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
~~L2~~	Implement traffic survey for Llangennech / Dafen / Thomas Street to establish why that route is used.	Understand driver habit / route choice	County Council	2019	2020	Survey results	0%	None	Traffic Modelling Study to include surveys	2021	Information gathering to help inform other potential interventions
~~L14~~	Identify and review HGV delivery timings to businesses in and around the town centre.	Reduce congestion and emissions	County Council / Partners	2020	2021	Possibly traffic counts / monitoring results	0.5%	Developments within the AQMA conditioned to avoid peak times. Difficult to influence and no resource to undertake	Reviewed upon new planning developments to avoid peak times, where applicable. This measure is difficult to influence and may not reduce overall emissions, but short-term higher emissions from congestion at peak times. This one is difficult to deliver and difficult to monitor its impact. It will be considered as part of the Regional Transport Plan work next year.	2021	May not reduce overall emissions, only higher emissions during congestion at peak times

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
~~L13~~	Feasibility study of closing the turning junction from Felinfoel Road to Old Road.	Reduce congestion & emissions, improve road safety	County Council	2019	2021	Monitoring results	1 -2%	None	Rejected under consideration with proposals to improve to bus stop and Thomas Arms junction	2021	
~~L18~~	Feasibility study for creating a roundabout at Felinfoel/Thomas Street/Old Road junction.	Improve traffic flow and reduce emissions	County Council	2019 - 2020	2021 - 2022	Monitoring results	0.5%	None	Rejected as standalone item, to be considered as part of improvements to Thomas Street Junction	2022	
~~L19~~	Feasibility study for creating a one-way section of Old Road between Thomas Arms and Bowls Club. (Link to L13)	Reduce congestion & emissions, improve road safety	County Council	2019	2020 - 2021	Monitoring results and traffic counts	1%	Traffic counts conducted	Rejected as standalone item consideration with proposals to improve to bus stop and Thomas Arms junction	2021	
~~L13, L18 &L19~~ ~~Replaced with this measure~~	Improvements to Thomas Street Junction at turning to Old Road	Strategic Highway Improvements Traffic reduction	County Council	2020	2021	Monitoring data Queue lengths		Road Safety Grant Covid Recovery Funding (£130k- £140)	Proposals to improve bus stop and reduce idling engines and incorporate GI in this area Pedestrian Safety need identified	Completed 2021	Reduction expected at nearest receptors by moving traffic flow further away
	Medium-Low Priority										

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
~~L15~~	Review/improve signage to M4 (link to L3), identify preferred routes through town.	Reduce congestion	County Council / SWTRA / WG	2019	2020	Traffic counts	?	Signage Strategy planned Improvements to junction 48 current signage in place	A review of the current signage directs drivers to M4 along preferred routes, signage does not encourage driving through the AQMA unnecessarily to reach the M4	2022	
	GENERAL ACTIONS FOR CARMARTHEN & LLANELLI										
A	Feasibility study for Low Emission Zones.	Reduce emissions	County Council / SWTRA	2022	?	Monitoring results	?	None	WG Clean Air Plan has proposal for all new cars and LGV's in public sector to be ULE by 2025	?	
B	Feasibility study for Congestion Zones.	Improve traffic flow, reduce emissions	County Council	2022	?	Monitoring results	?	None	None (For consideration if other measures do not reduce emissions enough)	?	
C	Introduce Taxi Idling Ban.	Reduce emissions	County Council	2021	?	?	?	No areas identified as a problem	None	?	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
~~D~~	Implement Idling Ban outside of schools etc.	Reduce emissions	County Council	2019	2020 - 2021	Monitoring results	?	Enquiries being made (suggested as an All-Wales approach through WG Consultation) Liaison with Schools WG looking to strengthen powers under Clean Air Act	Traffic Orders prohibiting stopping outside the school gates at certain times at several schools across the county. Progress on a school street in Burry Port, Elkinton Park and Morfa Primary School Llanelli	2022	
E	~~Introduce Supplementary Planning Guidance (e.g. provision of EV Charging points (– what criteria?).~~ Produce an electric Vehicle Strategy	Emissions reduction	County Council	2019	2020 - 2021	Number of EV charging points	?	26 additional charging points in 24 carparks installed across County. Electric vehicle Strategy under consideration, paused pending WG's release	Funding sought to commission studies on predicting future demand and additional locations along with a commission to complete and adopt a Carmarthenshire specific EV strategy in line with latest Welsh Government draft strategy 2020. Draft Strategy due to be published 2022	2022	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
~~H~~	Engagement with SAT NAV providers to highlight AQMA's	Emissions reduction and improve congestion	County Council / WG	2016	WG included in Consultation document		?	Working with WG / WAQF	Introduced in WG AQ policy Sat Nav's do not recognise AQMA's unless a low emission or congestrion zone has been imposed for the area.	Rejected	Reducing traffic speed in built up areas may help Sat Nav's recognise alternative routes as fastest route
~~G~~	Feasibility study for messaging system that alerts of road works that may increase pollution levels over short periods.	Health Protection at very local level	County Council / Partners	2019	?	Number of users on system	?	Investigating options	This measure was combined with P below. Google maps is also very effective in alerting of roadworks.	2021	
I	Feasibility study for shared use footpaths. (with markings?)	Increase uptake of alternative travel	County Council	2018	2020	?	?	Sustainable Transport Fund (£1.7m)	Funding secured for design. Bid submitted for funding the construction.	2022	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
J	Advertise cycle paths.	Alternative transport	County Council	On going	Already being done	Cycle path counters	?	Cycle routes advertised on internet. Funding secured promote further. Cycle routes advertised on internet and discovercarmarthenshire.com Improvements to be made as additional new paths created	Wayfinding strategy has been completed. Installation of recommended signage has begun.	2022	Impossible to identify reduction in emissions.
K	Advertise offices that have facilities for cyclists. (Increase number of offices/buildings providing cycle safe storage)	Encourage staff to use alternative transport	County Council	2019	2020	Use of facilities / Uptake of Cycle to work scheme	?	Pool bicycles available to Council staff in Carmarthen Cycle parking facilities at staff offices under review	Staf Travel review planned	2021	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
L	Produce and distribute public ~~car stickers with~~ messages (e.g. – turn engine off when parked/idling, slow down, consider air quality, stay back from car in front).	Public Information	County Council	2021	?	?	?		Social media messages as parts of National Clean Air Days	?	
M	Check tourist route maps / websites for advised routes (avoid AQMA's where relevant)	Appropriate travel routes used	County Council / SWTRA	2022	?	?	?	None	Review indicates correct instructions on Discover Carmarthenshire, balance not to deter visitors from the town centres	?	
N	Review & improve timings of bin collections & road sweeping	Improve congestion	County Council	2022	?	?	?	WG Clean Air Plan has proposal for all HGV's in public sector to be ULE by 2030, so focus may be redirected here.	The new routes have been routed in order to make them more efficient, move to zonal working, reducing the need for vehicles to be traveling across the whole county on any given day.	2022	
O	Feasibility study of making towns and villages vehicle free.	Reduce emissions	County Council	2022	?	Monit oring	?	None	Clean Air Zone Framework to be published by WG Spring 2021	?	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
~~P~~	Establish communications network with haulage contractors to improve service delivery.	Reduce emissions	County Council / Partners	? (Link with G)	?	?	?	None	CCC Roadworks webpage links the live traffic map indicating all roadworks and projects which have traffic management on the highway network. Tabs also allow options on timeframes for drivers to plan their journey in advance.	2021	
Q	Assess reward scheme for people who rarely use cars or for those that walk/cycle frequently.	Reduce emissions	County Council	2019	2019	Uptake	?	2019 cycle to work day competition	(Opportunities to reward staff for participating in active travel days/ Air Campaigns)	ongoing	
R	Facilitate retrofitting buses / coaches to gas fuel.	Reduce emissions	County Council / Partners	2021	?	Uptake	?	None	Clean Air plan target for all buses to have zero exhaust emissions by 2028	?	
S	Diesel engine vehicle ban.	Reduce emissions	County Council / Partners	?	?	?	?	None	Government proposals to phase out sales of Diesel and Petrol cars and vans by 2040.	?	
T	Enhance walking routes.	Alternative travel	County Council	2017	On-going	Path counters	?	Various routes introduced	Improvements to footpaths planned for Llanelli. Pedestrianised routes improved, introduced through planning development	?	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
~~U~~	Improve access to M4 through Llangennech area.	Reduce congestion and emissions	County Council / SWTRA / WG	When started	~~2018~~ 2021	?	?	Funding allocated by WG	Improvement works completed to improve junction 48, Widening of A4138 to reduce congestion provide shared foot/cyleway work commencing 2021	2022	
V	Introduce green infrastructure or urban planting schemes. (possibly through Planning)	Emissions reduction	County Council / Partners	On going	?	Number of schemes	?	Included through planning developments Consideration to developing a Green Infrastructure strategy GI Infrastructure has been mapped GI schemes Included BID for Jackson's Lane Carmarthen and Newcastle Emlyn	Consultation carried out on a Green and blue Infrastructure strategy, draft to be developed 2022	?	Co-benefits of GI - reducing pollution levels and improving Health and Wellbeing

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
~~W~~	Discuss with WG barriers / opportunities to transfer road freight from ferries to rail freight.	Emissions reduction	County Council / WG	2021	?	?	?	Increasing rail freight options considered within study to reduce traffic to M4 and rail network improvements	Wales Transport Strategy Llwybr Newydd has been published 2021 and includes support for interventions that shift freight from road to rail. 5 year national transport delivery plan is being developed. Regional Transport Plans are also to be developed.	?	
X	Liaise with 'Car Club' facilitators for opportunities to introduce across the County.	Emissions reduction	County Council / Partners	2018	2019	Uptake of Lift sharing	?	No car clubs currently operate in Carmarthenshire AQMAs Considering options. DolenTeifi community have 9 EV minibuses 4 EV's and 2 and MPV's available for the community to hire.	Dolen Teifi continue to increase provision of vehicles	?	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
~~¥~~	Feasibility study of bike hire schemes.	Emissions reduction / alternative travel	County Council / Partners	2019	2020 - 21	Uptake	?	Available in Carmarthen Park and Pembrey Country Park	Brompton electric bike hire docking stations ordered for Llanelli, Carmarthen Bus station and Pembrey Burry Port multimodal interchange	2021	
	LLANDEILO **Phase 1**										
3a	Assess and reduce parking provision along Bridge Street if possible. [Gerwyn's Fruit & Veg]	Improve congestion	WG / SWTRA	2015	2017	Monitoring data	2-4%	Assessed within first year review, no action possible at this time.	WG Transport Study considering option	2017	Link with 3d
3b	Assess and reduce parking provision along Rhosmaen Street if possible. [St Teilo's Church].	Improve congestion	WG / SWTRA	2015	2017	Monitoring data	2-4%	Traffic Orders issued in March 2017 Traffic Enforcement ongoing	WG Transport Study considering option	2017	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
3c	Assess and reduce parking provision along Rhosmaen Street if possible. [Cawdor Hotel].	Improve congestion	WG / SWTRA	2015	2017	Monitoring data	6-10%	Assessed within first year review, removal of loading only bays would result in parking on the carriageway	None	2017	
3d	Assess and reduce parking provision along Rhosmaen Street if possible. [Opposite Principality Building Society].	Improve congestion	WG / SWTRA	2015	2017	Monitoring data	2-4%	Traffic Order issued March 2017	Traffic Enforcement ongoing		
C2	Review parking provision in town with respect to removing residents parking during the day to allow shared use thereby alleviating the need to park on Rhosmaen Street and supplementing Crescent Road car park.	Improve congestion	WG / SWTRA / CCC	2015	2017	Monitoring data	?	Traffic orders issued providing shared used of spaces, Coaches now drop off in Crescent Road carpark rather than Rhosmaen Street	Traffic Enforcement ongoing		

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
C3	Assess parking charges in the town to determine any benefits from reduction or removal of charges particularly to encourage more appropriate parking.	Improve congestion	CCC	2015	2017	Use of Carpark	?	Review of charges carried out.	Pilot of free parking Monday, Tuesdays and Wednesdays started Oct 2018		Insufficient evidence that it will identify improvement in AQ.
7	Look at possibility of service delivery to rear of business premises rather than along Rhosmaen Street.	Improve traffic flow, reduce emissions	CCC	2015	2016	Monitoring data	6-8%	Survey carried out, 10 out of 14 properties benefit and use rear access for deliveries	None	2016	
8	Promote cycling and walking to school more. Provide incentives such as free cycle helmets if children cycle to school more than 75 times in a year.	Emissions reduction / alternative travel	CCC	2015	2017	Monitoring data	?	Links with Living Streets and walking to school campaigns promoted.	School Travel plans to encourage sustainable travel Council's Cycling Strategy 2018		

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
9	Promote car sharing to work/school. Website has been set up for the rural heartland north of Llandeilo for people commuting to Swansea / Llanelli / Carmarthen etc.	Emissions reduction / alternative travel	CCC	2015	2017	Uptake of car sharing	?	Share Cymru promoted on Council website	Increase in use of Llandeilo Train station		
11	Improve parking issues on the street with additional or more frequent enforcement.	Improve traffic flow, reduce emissions	CCC	2015	2017	Monitoring data	4-6%	Traffic orders issued March 2017	Enforcement ongoing		
20	Identify if bus stops along the street can be improved to allow free flow of traffic.	Improve traffic flow, reduce emissions	CCC with WG / SWTRA	2015	2017	Monitoring data	?	Assessed in first year review, no other suitable locations for main bus route, however coaches now drop off in Crescent Road carpark	None	2017	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
21	Publicise alternative routes (possibly through haulage associations) to destinations north of Llandeilo so that vehicles can avoid the town.	Reduce number of vehicles travelling through AQMA unnecessarily	CCC with WG / SWTRA	2015	Once other routes available	Monitoring data / Traffic Counts	3-6%	No alternative routes available	Proposals for alternative routes under consideration in Llandeilo and Ffairfach Transport Study		Link with actions C1 and C4
22	Identify peak use of the road e.g. school run, mart days and markets – then target improvements / restrictions / alternative routes during these times.	Improve traffic flow, reduce emissions	CCC with WG / SWTRA	2015	2017	Monitoring data	?	Assessed in second year review	None	2017	
C4	Assess feasibility of a six month trial of HGV diversion away from town (except for deliveries).	Reduce traffic congestion emissions	CCC with WG / SWTRA	2015	2017	Traffic Count monitoring data	3-6%	Discussions with Welsh Government and SWTRA	WG Transport Study considering option Under consideration require re-routing		Link with C1 and 3d

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
C1	Assess the feasibility of implementing a 15t weight limit on bridge below Bridge Street to ensure that larger vehicles were diverted away from the town.	Reduce traffic, congestion and emissions	WG / SWTRA	2015	2017	Traffic Count monitoring data	3-6%	Discussions with Welsh Government and SWTRA	Under consideration requires re-routing		Link with C4 and 3d
	Phase 2										
5	Improvements to street layout i.e. pedestrian crossing, pavement width improvements.	Reduce traffic Improve pedestrian safety	WG / SWTRA	2018 - 2020	TBC	Monitoring data	8-12%	Under consideration	Included as option for the Llandeilo and Ffairfach Transport study		Opportunity for Green Infrastructure if delivered
6	School buses arriving / leaving at definitive staggered times and their routes using the Bethlehem / Llangadog, Llangathen option.	Reduce traffic Improve pedestrian safety	CCC	2018-2020	TBC	Alternative route used monitoring data	2-4%	Ysgol Bro Dinefwr has large catchment area and many coach movements	Under consideration as part of re-routing HGV's		
	Phase 3										

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
16	Encourage a park and ride scheme.	Reduce traffic and emissions	CCC	2018-2020	TBC	Introduction of a scheme	?	Train option from Ffairfach to Llandeilo,	Improvements to public transport infrastructure and integration between bus and rails services is under consideration as a wider opportunity to Llandeilo transport schemes		
	Phase 4										
1	Diversion of HGV's to other routes and/or their restriction to certain hours through the town e.g. to avoid commuting and school run.	Reduce number of vehicles travelling through AQMA unnecessarily	WG / SWTRA	2018-2020	TBC	Traffic Count monitoring data	8-12%	Included as option for the Llandeilo and Ffairfach Transport study	HGV restrictions have not been shortlisted due to the lack of viable alternative routes		
2	One-way system with vehicles diverted around King Street.	Improve traffic flow, reduce emissions	WG / SWTRA with CCC	2018-2020	TBC	Traffic Count monitoring data	10-17%	Under consideration	Included as option for the Llandeilo and Ffairfach Transport study		

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
4	Traffic light system at peak times to reduce the fumes problem at pinch points in the centre of town.	Reduce congestion and emissions	SWTRA	2018-2020	TBC	Monitoring data	?	Under consideration	Included as option for the Llandeilo and Ffairfach Transport study		
12	Implementation of traffic lights either end of Rhosmaen Street to regulate single stream of traffic thereby improving free flow.	Reduce congestion and emissions	WG / SWTRA	2018-2020	TBC	Monitoring data	?	Under consideration	Included as option for the Llandeilo and Ffairfach Transport study		
17	Build a by-pass.	Reduce number of vehicles travelling through AQMA unnecessarily	WG	2018-2020	**TBC**	Traffic Count monitoring data	40%	Under consideration	Included as option for the Llandeilo and Ffairfach Transport study		
18	Close Rhosmaen Street to traffic (except deliveries).	Reduce number of vehicles travelling through AQMA unnecessarily	WG / SWTRA with CCC	2018-2020	TBC	Traffic Count monitoring data	50%	Under consideration	Included as option for the Llandeilo and Ffairfach Transport study		

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
19	Remove parking bays and loading bays	Improve traffic flow, reduce emissions	WG / SWTRA	2018-2020	TBC	Monitoring data	?	Under consideration	Included as option for the Llandeilo and Ffairfach Transport study		Link with action 5 under phase 2
23	Variable diversion within set NO_2 limits (using continuous monitoring equipment.	Reduce emissions	WG / SWTRA with CCC	2020	TBC	Monitoring data	?	Still to be considered	Sensor equipment explored		

Table 1.4 – Action Plan Measures Not Pursued and the Reasons for that Decision

The following measures have been removed from Purpose of an Annual Progress Report and the action plans after further consideration by the Action Plan Steering group.

Action category	Action description	Reason action is not being pursued further
Promoting Travel Alternatives	C11 – Investigate a bike Hire scheme for Carmarthen Town	Brompton Bike Hire Docks Installed in Blue Street, Carmarthen, next to the bus station completed January 2021.
Traffic Management	C13 - Review pedestrianisation across town.	Temporary Restrictions were introduced in Llanelli and Carmarthen Town Centre for the pandemic to support social distancing. This has since been reviewed and the measures were removed in 2021 following public consultation. Town Centre Regeneration plans are being developed to support recovery. The plans will explore opportunities and options for the development of infrastructure in town centres to support Active Travel journeys Regeneration plans are under development.
Traffic Management	L1 - Assess traffic light sequencing for Thomas Street/Gelli Onn junction.	No changes considered necessary, the lights operate according to the number of vehicles approaching. Not included within AQ Delivery Plan adopted for 2021.
Promoting Travel alternatives	L2 - Implement traffic survey for Llangennech / Dafen / Thomas Street to establish why that route is used.	Survey not conducted, Improvements from Hendy M4 aims to support active travel modal modes. Sat Navs often determine the quickest route to Llanelli West and this is difficult to influence
Alternatives to private vehicle use	L6 - Bus based park and ride (Llanelli)	Llanelli has a good bus transport network to support movement into the town. Improved real time information at bus stations/ stops and links to active travel network and metro project. The option for a park and ride service in Llanelli is not considered operationally or financially feasible.
Traffic Management	L13, L18 & L19 Improvements to Thomas Street Junction at turning to Old Road	Improvements to bus stop, junction (moving traffic away from receptors) and reduce idling engines in this area. Pedestrian crossing also installed in lower Felinfoel Road to improve pedestrian safety and encourage more local journeys by foot.

Public Information	F - Engagement with SAT NAV providers to highlight AQMA's	Currently Sat Nav's recognise Clean Air Zones but not AQMA's. This measure is not feasible unless congestion zone or Low Emission Vehicle zone declared. Further research will be undertaken as part of the development of the Regional Transport Plan.
Reducing Congestion	L8 - Feasibility study for a by-pass for Sandy Road.	These options have been discarded due to significant environmental, social and cost constraints. Furthermore, constructing a bypass off the Sandy Road Corridor would not align with current Welsh Government Transport Policy.'Llwybr Newydd –a new Wales Transport Strategy' sets out the Welsh Governments vision for an accessible, sustainable transport system; supported by the following five-year priorities: 1.Reduce green house gas emissions by planning ahead for better physical and digital connectivity, more local services, more home and remote working and more active travel, so that fewer people need to use their cars on a daily basis. 2.Grow public transport use In Wales by providing services that everyone can use, wants to use, and does use, based on: 3.Safe, accessible, well-maintained and managed transport infrastructure that is also future-proofed to support public transport and electrification especially walking and cycling. 4.Making sustainable transport choices more attractive and affordable to more people and businesses, whilst respecting the fact that many people including those in rural areas or disabled people, may not have options, and 5.Supporting innovations that help more people and businesses adopt more sustainable transport choices.
Public Information	L15 - Review/improve signage to M4 (possibly link to L14), identify preferred routes through town.	A review of the current signage directs drivers to M4 along preferred routes, signage does not encourage driving through the AQMA unnecessarily to reach the M4
Freight and Delivery Management	L14 -Identify and review HGV delivery timings to businesses in and around the town centre.	Reviewed upon new planning developments to avoid peak times, where applicable. This measure is difficult to influence and may not reduce overall emissions, but short-term higher emissions from congestion at peak times. This one is difficult to deliver and difficult to monitor its

		impact. It will be considered as part of the Regional Transport Plan work next year.
Freight and Delivery Management	G - Establish communications network with haulage contractors to improve service delivery.	CCC Roadworks webpage links the live traffic map indicating all roadworks and projects which have traffic management on the highway network. Tabs also allow options on timeframes for drivers to plan their journey in advance.
Freight and Delivery Management	P - Establish communications network with haulage contractors to improve service delivery.	CCC Roadworks webpage links the live traffic map indicating all roadworks and projects which have traffic management on the highway network. Tabs also allow options on timeframes for drivers to plan their journey in advance.
Freight and Delivery Management	W - Discuss with WG barriers / opportunities to transfer road freight from ferries to rail freight.	Wales Transport Strategy Llwybr Newydd has been published and includes support for interventions that shift freight from road to rail. 5 year national transport delivery plan is being developed. Regional Transport Plans are also to be developed. This action is not under our control. The Regional Transport Plan process will make reference to freight.
Transport Planning and Infrastructure	U - Improve access to M4 through Llangennech area.	Widening of A4138 to reduce congestion and provide shared foot/cycleway to encourage travel modal shift. Improves access on and off the M4 to reduce traffic congestion at peak times. Completed 2021.
Traffic Management	D- Implement Idling Ban outside of schools etc.	Traffic Orders prohibiting stopping outside the school gates at certain times at several schools introduced across the county.

Delays in Progressing Llandeilo measures

Work towards constructing a Llandeilo relief road was initially timetabled to start at the end of 2019. However, at the start of 2020 this was then delayed until Autumn 2022 due to the consideration of objections received during the consultation process. It was then planned to hold a further stakeholder consultation around Nov-Dec 2019, but in light of the further work needed, this latest WeiTag Stage 2 consultation on this study was scheduled for April 2020 but unfortunately postponed again to September 2020, due to the COVID pandemic. A further update was announced indicating that for a long-term measure such as this, work would not begin until 2025. Although work on shorter- and medium-term measures will progress sooner. Carmarthenshire County Council are still awaiting the final recommended outcome following the WeiTag Stage 2 assessment from Welsh

Government, which wis postponed to be announced Winter 2022. Carmarthenshire County Council remains of the opinion that a Bypass is the only option that will deliver significant improvements to Air Quality and support other co-beneficial measures to improve pedestrian safety and encourage more active travel.

2 Air Quality Monitoring Data and Comparison with Air Quality Objectives

2.1 Summary of Monitoring Undertaken in 2021

2.1.1 Automatic Monitoring Sites

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

Carmarthenshire County Council has no automatic (continuous) monitoring sites within its administrative area.

2.1.2 Non-Automating Monitoring Sites

Carmarthenshire County Council undertook non- automatic (passive) monitoring of NO_2 at 98 sites during 2021. Table 2.1 presents the details of the sites.

Maps showing the location of the monitoring sites are provided in Figures 2.1 – Map(s) of Non-Automatic Monitoring Sites. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

Details of screening exercises

Two new sites were set up in Llanelli during 2021, one was located in the Tyshia ward along Station Road, south of the AQMA boundary. The diffusion tube was located north of Llanelli Railway Station, labelled TYL5, and in replacement of the nearby TYL3 which had been removed from scaffolding works and was no longer accessible, nonetheless TYL5 was located on the façade of a residential building whereas TYL3 was on a roadside lampost. A map of the tube site location can be found in Figure 2.5 - Map of Llanelli NO2

Development is planned in this area and so monitoring should help identify any impacts ahead. During 2021 TYL5 and TYL3 reported annualised results of 14.3µg/m^3 and 16.0µg/m^3 respectively. TYL5 is located on the façade of a residential property and provides a more representative exposure. Other sites in this area include TYL1, TYL2 and TYL4, all of which reported results between 14µg/m^3 and 17.6µg/m^3.

One new diffusion tube site was set up and located further South of Llanelli and outside of the Llanelli Town Centre AQMA, referenced Carm/146, a map of the tube site location can be found in Figure 2.15 - Map of Pantyblodau, Ammanford, . The new site was set up in 16 Trostre Road, Llanelli (Carm/146) following concerns raised about the volume of traffic and air quality impacting on residents' health. Traffic counts conducted in 2017 indicated volumes approximately 16337 AADT, reducing to 13500 in 2020. Only four months valid data was captured between September to December and the annualised result was 15.1µg/m^3 and below the air quality objective, however the site will continue to be screened into the end of 2022, given the volume of traffic and to indicate a better picture of the exposure as normal travel behaviours resume.

In March 2021, a new diffusion tube site PBB1 was set up to screen the impact of a speed bump that had been newly installed in Pantyblodau Road, Blaenau, Ammanford. A map of the tube site location can be found in Figure 2.15 - Map of Pantyblodau, Ammanford, . Concerns were raised regarding fumes from heavy good vehicles travelling over the bumps. Although, traffic counts from 2017 for this area were below 5000AADT they were above 4000 with 8.6% HGV. This screening exercise was therefore carried out for 6 months between March to August 2021. PBB1 reported an annualised result of 5.7µg/m^3, and so this was significantly below the air quality objective.

Another new site was set up at Ty Rhys, Carmarthen (Carm/TR) following concerns about the air quality in the area with regards to a nearby carpark and bypass. The site is located outside of the AQMA boundary. A map of the tube site location can be found in Figure 2.7 - Map of Carmarthen Town Centre NO_2 Non-Automatic Monitoring Sites (screening) An eight- month screening exercise was carried out between May and December, however only 7 months valid data was captured, the annualised result for this exercise was 9.3µg/m^3, which is significantly below the air quality objective.

In February 2021, diffusion tube sites were reinstalled in the Ffairfach area, south of the Llandeilo AQMA boundary. This area had been previously monitored and removed in 2018 due to reported low results. However, there were plans to remove the roundabout and introduce signalised traffic lights instead, in order to improve pedestrian safety as it's a route frequently used by children walking to the nearby schools. An air quality assessment determined that the change should not have significant impact on air quality however it may increase some congestion and queue lengths during peak times. The sites included FA/03(A), FA/04(A), FA/06(A) and FA/07(A). A map of the tube site location can be found

in Figure 2.14 - Map of Ffairfach, Llandeilo NO2 Non-Automatic Monitoring Sites (Screening exercise). The annual results were between 5.8µg/m^3 and 14.2 µg/m^3, with FA/03(A) providing the highest reading and located on the southern boundary of the Llandeilo AQMA. Works finished in 2021, so monitoring will continue into 2022 to assess the full impact.

Two further tubes were located within the Llanelli Town Centre AQMA, referenced Carm/144 and Carm/145, a map of the tube site location can be found in Figure 2.6. This was set up in 2020 to monitor the air quality following a decision to impose temporary vehicle restrictions from 10am to 4pm from August 2020 to boost trade by supporting pedestrians during peak shopping times and help socially distancing measures, safe queueing, and more outdoor socialising. The sites observed annualised results between 10 - 11µg/m^3 during 2020 and monitoring continued into 2021 to observe the difference after a decision was made to remove the restrictions. Results in 2021 reported 9.7 µg/m^3 for Carm/144 and 11.2 µg/m^3 for Carm/145. Although the traffic restrictions may have contributed to cleaner air during busy shopping times, there were more vehicles visiting or delivering outside of these times therefore the impact was negligible against the annual mean.

Two additional tubes were also set up in Carmarthen Town centre in 2020 to monitor the impact of vehicle restrictions in King Street and other Town Centre Measures to support social distancing measures similarly to Llanelli. The sites are referenced Carm/112a and Carm/143 and a map of the sites locations can be found in **Figure 2.6 - Map of Llanelli NO2 Non-Automatic Monitoring Sites**
(AQMA) (Road closure Screening Assessment)
Figure 2.7 - Map of Carmarthen Town Centre NO2 Non-Automatic Monitoring Sites (screening) This monitoring also started in August 2020 for a period of 5 months, and continued into 2021 (without restrictions), to compare the difference. King Street Carm/143 was located at the site with traffic restrictions, it reported an annualised result of 12.7µg/m^3 for 2020 and 11.0µg/m^3 for 2021. It does not appear that the restrictions had a significant impact.

Two diffusion tube sites continued to monitor roadside NO2 in Llangennech, Llanelli, a village that lies some distance away from the Llanelli AQMA boundary. Nonetheless, the main road travelling though the village is quite narrow in parts with several terraced properties, and the restricted space on the road creates difficulties for two-way traffic to

pass at the same time which can result in congestion during peak times. Tubes were initially set up in 2019 for a 9-month study but continued into 2020 s set up to monitor any changes that may arise from future developments. The two sites monitor roadside emissions on Bridge Street (LLG3) and Afon Road (LLG2), a map can be found in **Figure 2.10 - Map of Llangennech, Llanelli NO2 Non-Automatic Monitoring Sites**Figure 2.10. No exceedances of the Air Quality Objective were observed as both sites reported a concentration level below 16µg/m^3.

Eight sites referenced RPS/1, RPS/2, RPS/3, RPS/4, RPS/5, RPS/6, RPS/7, and RPS/8 were set up in and around Richmond Park Primary School in 2020 as part of a project to monitor NO_2 levels in and around the school gates. The 11-month study was extended to continue through to the end of 2021, to allow a comparison of the differences during lockdown restrictions. The school was closed for a significant period during 2020 and all sites around the school reported an annual result between 7-9 µg/m^3. Still, it was not considered to be reflective of typical travel behaviours. A map of the tube site locations can be found in Figure 2.13 - Map of Richmond Park School, Carmarthen NO2 Non-Automatic Monitoring Sites (Screening exercise). This area is located within the Carmarthen AQMA boundary between Priory Street and Richmond Terrace. The project enabled us to observe the levels of exposure in the school yard arising from the surrounding main roads, along site the staff carpark and council public carpark located alongside. Engagement with the school pupils was disrupted due to COVID19, however monitoring was able to continue. 2021 results were just marginally higher than 2020 and all in the region of 8-10 µg/m^3.

Monitoring continued in the surrounding area of the proposed Economic Link Road in Cross Hands (Carm/ELR 9, 10,11, 12 ,21 and 22). Carm/ELR 16, 18, 19 & 20) and three within the SSSI (Carm/ELR6, 7 & 8) located alongside the economic link road were removed for 2020 and 2021 due to construction moving to another phase. Carm/ELR 14, 15, and 18 were not able to be reinstated following removal in 2019 because they were located alongside the new link road and were in the way of its construction. This screening exercise will enable us to monitor the current levels of NO_2, monitor any impacts during construction and assess the impact the economic link will make following its completion in 2022. A map of the area and tube sites can be found in Figure 2.12.

Maps showing the location of the monitoring sites are provided in Figures 2.1. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in QA/QC of Diffusion Tube Monitoring.

Table 2.1 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
Carm/089	Ammanford - Tir Y Dail Lane (2)	Kerbside	N/A	262804	212204	2.6	No	0.5	1.5	1.0
Carm/064	Ammanford – Wind Street	Roadside	N/A	262936	212285	2.9	No	1.0	3.0	2.0
Carm/090	Ammanford -High St (2)	Roadside	N/A	263028	212324	2.8	No	0.0	3.0	3.0
DAL/14	10 Sandy Road	Roadside/Façade	Llanelli	249701	200598	2.8	No	0.0	4.9	4.9
DAL/15	33 Sandy Road	Roadside/Façade	Llanelli	249727	200608	2.5	No	0.0	4.7	4.7
Carm/077	Sandy Rd (2)	Roadside	Llanelli	249606	200638	2.8	No	4.0	5.7	1.7
DAL/22	44 Sandy Road (3)	Roadside/Façade	Llanelli	249610	200632	2.8	No	0.0	5.6	5.6
DAL/26	123 Sandy Road	Roadside/Façade	Llanelli	249483	200713	2.6	No	0.0	7.5	7.5
DAL/27	Sandy Road (4)	Roadside	Llanelli	249483	200709	2.9	No	4.2	7.5	3.3
DAL/16	96 Sandy Road	Roadside/Façade	Llanelli	249456	200706	2.7	No	0.0	5.1	5.1
DAL/17	131 Sandy Road	Roadside/Façade	Llanelli	249463	200724	2.8	No	0.0	5.3	5.3
Carm/141	Llanelli - 3 Old Road	Roadside/Façade	Llanelli	250649	200786	2.9	No	0.0	1.5	1.5
DAL/07	nr 13 Felinfoel Road	Kerbside	Llanelli	250717	200818	2.8	No	0.5	1.3	0.8

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
DAL/23	50 Felinfoel Road	Roadside/Façade	Llanelli	250754	200870	2.9	No	0.0	2.1	2.1
DAL/09	Thomas St (Barnados)	Roadside/Façade	Llanelli	250709	200673	2.8	No	0.0	2.7	2.7
Carm/104	Thomas St (2)	Roadside/Façade	Llanelli	250719	200689	3.0	No	0.0	1.7	1.7
DAL/10	Thomas St (Bridal Shop)	Roadside/Façade	Llanelli	250734	200603	2.7	No	0.0	1.6	1.6
Carm/069	West End	Kerbside	Llanelli	250458	200603	2.8	No	6.0	6.2	0.2
DAL/12	West End (Creative Cakes)	Kerbside	Llanelli	250411	200616	2.8	No	1.7	1.9	0.2
DAL/28	West End, Pentip School	Roadside	Llanelli	250344	200631	2.4	No	0.4	2.8	2.4
DAL/04	51 Panteg Road	Roadside	N/A	251623	201976	2.8	No	0.3	1.3	1.0
Carm/114	Panteg Road	Roadside	N/A	251665	202013	2.7	No	0.4	1.6	1.2
Carm/113	Swiss Valley	Roadside	N/A	251951	202411	2.9	No	0.4	1.5	1.1
Carm/135	23 Bassett Terrace	Roadside/Façade	Llanelli	248512	200892	2.5	No	0.0	1.7	1.7
TYL1	34 Station Road	Roadside	N/A	250567	199977	2.8	No	0.2	5.2	5.0
TYL2	132 Station Road	Roadside	N/A	250713	199530	2.5	No	0.3	5.1	4.8
TYL3	107 Station Road	Roadside	N/A	250740	199503	2.5	No	1.0	3.9	3.0
TYL4	47 New Dock Road	Roadside	N/A	250895	199157	2.5	No	0.4	1.7	1.4
Carm/144	John Street	Roadside	Llanelli	250619	200222	2.5	No	1.6	3.5	1.9

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
Carm/145	Cowell Street	Kerbside	Llanelli	250618	200291	2.4	No	2.3	2.8	0.5
DAC/06	Glenholme Nursery - Richmond Terrace	Kerbside	Carmarthen	241546	220536	2.7	No	2.2	3.0	0.8
DAC/13	Carmarthen - 72 Richmond Terrace (2)	Kerbside	Carmarthen	241559	220554	2.7	No	0.3	1.3	1.0
Carm/109	Carmarthen - Richmond Terrace	Kerbside	Carmarthen	241596	220563	2.7	No	0.2	0.8	0.6
DAC/08	Carmarthen - 85 Priory Street (E)	Roadside	Carmarthen	241876	220565	2.7	No	0.4	1.5	1.1
DAC/14	Carmarthen - 50 Priory Street	Roadside	Carmarthen	241932	220583	2.9	No	0.4	1.7	1.3
DAC/15	Carmarthen - Old Oak rdbt (E)	Roadside	Carmarthen	241816	220519	2.9	No	1.5	3.9	2.4
Carm/111	Carmarthen - Church Street	Roadside	Carmarthen	241539	220179	3.0	No	0.7	3.5	2.8
DAC/12	Carmarthen - 24 Spilman Street	Roadside/Façade	Carmarthen	241492	220171	2.8	No	0.0	3.0	3.0
DAC/04	Carmarthen - Water Street (Probation Office)	Kerbside/Façade	Carmarthen	240931	220144	2.8	No	0.0	0.9	0.9

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
Carm/072	Carmarthen - St. Catherine St rdbt	Roadside	Carmarthen	240688	220057	2.8	No	0.3	3.3	3.0
DAC/02	Carmarthen - 15 Park Terrace	Kerbside	Carmarthen	240618	220041	3.0	No	0.4	1.4	1.0
DAC/16	Carmarthen - 6 Park Terrace	Roadside/Façade	Carmarthen	240557	220026	2.7	No	0.0	1.4	1.4
Carm/001	Carmarthen - St. Catherine St	Roadside	Carmarthen	240798	220155	2.8	No	0.3	2.0	1.7
Carm/084	Carmarthen - Water Street	Kerbside	Carmarthen	240831	220272	2.8	No	0.3	1.2	0.9
DAC/05	Carmarthen - 44 Water Street	Roadside/Façade	Carmarthen	240797	220297	2.7	No	0.0	1.3	1.3
Carm/106	Carmarthen - St Catherine St (A)	Roadside/Façade	Carmarthen	240979	220244	2.9	No	0.0	1.4	1.4
Carm/134	Carmarthen - 2 College Road	Other/Façade	N/A	240377	220397	3.0	No	0.0	5.6	5.6
Carm/126	Johnstown - 2 Jobs Well Road	Roadside	N/A	239914	219829	2.8	No	0.8	2.9	2.1
Carm/132	Johnstown - 7 Old St Clears Road	Roadside/Façade	N/A	239865	219745	2.6	No	0.0	7.0	7.0

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
Carm/133	Johnstown - 72 Llansteffan Road	Roadside/Façade	N/A	240039	219080	2.4	No	0.0	9.3	9.3
Carm/142	Johnstown Llansteffan Road (2)	Roadside	N/A	240048	219077	2.5	No	8.4	10.7	2.3
Carm/112a	Carm - Spilman Street	Roadside	Carmarthen	241450	220124	2.5	No	0.4	2.9	2.6
Carm/143	Carm - King Street	Roadside	Carmarthen	241221	220080	2.5	No	0.3	1.7	1.4
FA/01	North roundabout (No 8 Rhosmaen St)	Roadside	Llandeilo	263190	223000	2.6	No	1.5	3.1	1.6
DA/15	Rhosmaen Street (No 15) (north)	Roadside/Façade	Llandeilo	263150	222763	2.6	No	0.0	3.1	3.1
DA/01	Rhosmaen Street (No. 69)	Roadside	Llandeilo	263076	222596	2.7	No	3.0	4.3	1.3
DA/03	Rhosmaen Street (No. 87)	Roadside/Façade	Llandeilo	263021	222503	2.9	No	0.0	4.4	4.4
Carm/013	Llandeilo - Rhosmaen Street	Kerbside	Llandeilo	263006	222505	2.8	No	2.5	2.9	0.4
DA/05 (A), (B) & (C)	Rhosmaen Street (Evans Butchers)	Roadside/Façade	Llandeilo	262982	222445	3.0	No	0.0	1.5	1.5

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
DA/07	Rhosmaen Street (Castle Hotel)	Roadside/Façade	Llandeilo	262966	222412	2.9	No	0.0	1.7	1.7
Carm/083	Llandeilo - Rhosmaen Street (2)	Roadside	Llandeilo	262959	222396	2.8	No	1.0	2.5	1.5
DA/09	Rhosmaen Street (No. 123)	Roadside/Façade	Llandeilo	262951	222375	2.9	No	0.0	1.2	1.2
DA/10	Rhosmaen Street (No. 133) (Craft Shop)	Kerbside/Façade	Llandeilo	262933	222345	2.9	No	0.0	0.8	0.8
DA/11	Rhosmaen Street (No. 74) (Style Shop)	Roadside/Façade	Llandeilo	262924	222346	3.0	No	0.0	1.7	1.7
DA/12	Stryd Y Brenin (Travel House)	Roadside/Façade	Llandeilo	262908	222329	2.9	No	0.0	1.0	1.0
DA/13	Rhosmaen Street (Park Area)	Kerbside	Llandeilo	262906	222299	2.9	No	4.0	4.9	0.9
DA/14	Rhosmaen Street (Bin post by Bus stop)	Roadside	Llandeilo	262902	222250	2.8	No	3.0	4.2	1.2
DA/16	Bridge Street (N Trust) (south)	Roadside/Façade	Llandeilo	262848	222170	2.6	No	0.0	2.3	2.3

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
Carm/127	41 New Street, Burry Port	Kerbside	N/A	244999	200840	3.0	No	2.5	2.9	0.5
Carm/128	Lloyds Bank, New Street, Burry Port	Kerbside	N/A	244857	200828	2.9	No	0.5	1.4	0.9
LLG2	Llangennech – 28 Afon Road	Roadside	N/A	256144	201792	2.5	No	0.0	2.1	2.1
LLG3	Llangennech – 26 Bridge Street	Roadside	N/A	256050	201600	2.4	No	0.3	2.2	1.9
Carm/ELR1	Cross Hands (2) (N)	Roadside	N/A	256458	213067	2.7	No	6.1	7.7	1.5
Carm/ELR2	Cross Hands (House) (N)	Roadside/Façade	N/A	256465	213085	2.7	No	0.0	6.0	6.0
Carm/ELR3	Gorslas Sixways	Roadside	N/A	257027	213774	2.6	No	3.5	5.1	1.7
Carm/ELR4	Gorslas Sixways (2)	Roadside/Façade	N/A	257022	213777	2.7	No	0.0	6.9	6.9
Carm/ELR9	Gate Road (nr No. 81)	Roadside	N/A	257837	214594	2.7	No	3.5	5.3	1.8
Carm/ELR10	Norton Road (nr No. 43)	Roadside	N/A	258269	213646	2.8	No	4.5	6.8	2.3
Carm/ELR11	Norton Road (nr ELR jnc DP 24)	Roadside	N/A	257752	213562	2.5	No	4.5	6.3	1.8
Carm/ELR12	Norton Road (nr No. 94)	Kerbside	N/A	257563	213717	2.7	No	1.2	1.3	0.1

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
Carm/ELR21	Black Lion Road (nr Helyg)	Roadside	N/A	257564	212950	2.6	No	15.1	16.7	1.6
Carm/ELR22	Black Lion Road (nr Gorse Villa)	Roadside	N/A	257666	212864	2.8	No	3.2	5.4	2.2
RPS/1	Front Garden (South), Richmond Park School	Other	Carmarthen	241686	220474	2.4	No	0.0	60.0	60.0
RPS/2	Year One Playground, Richmond Park School	Other	Carmarthen	241651	220490	2.1	No	0.0	87.0	87.0
RPS/3	Flying Start, Richmond Park School	Other	Carmarthen	241625	220512	2.0	No	0.0	52.0	52.0
RPS/4	Main Building (North), Richmond Park School	Other	Carmarthen	241646	220535	2.0	No	0.0	41.0	41.0
RPS/5	Northern Yard, Richmond Park School	Other	Carmarthen	241648	220562	2.0	No	0.0	16.0	16.0
RPS/6	Nursery Playground (East), Richmond Park School	Other	Carmarthen	241694	220504	2.4	No	0.0	70.0	70.0

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
RPS/7	Staff Car Park, Richmond Park School	Other	Carmarthen	241683	220452	2.5	No	10.0	59.0	49.0
RPS/8	Public Carpark, Richmond Park School	Other	Carmarthen	241657	220473	2.5	No	1.1	83.1	82.0
FA/04(A)	Ffairfach Chapel	Roadside	No	262869	221274	2.6	No	1.8	2.9	1.1
FA/06(A)	10 Heol Myrddin, Ffairfach	Roadside	No	262780	221469	2.5	No	5.0	6.1	1.1
FA/03(A)	29 Towy Terrace	Roadside	Llandeilo	262853	221512	2.7	No	0.0	3.4	3.4
FA/07(A)	Heol Bethlehem (Opp School)	Roadside	No	262980	221490	2.7	No	16.0	17.5	1.5
ELR/10(B)	35 Norton Road , Gorslas	Roadside	No	258288	213651	2.7	No	0.0	3.7	3.7
PBB1	2 Pantyblodau Road	Other	No	260554	213765	2.2	No	0.0	9.9	9.9
TYL5	101 Station Road, Llanelli	Roadside	No	250735	199517	2.5	No	0.0	4.1	4.1
Carm/TR	Ty Rhys, The Parade, Carmarthen	Roadside	No	241725	220198	2.2	No	0.0	3.5	3.5

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
Carm/146	16 Lower Trostre Road, Llanelli	Roadside	No	251808	198929	2.3	No	0.0	2.1	2.1

Notes:

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

Figures 2.1 – Map(s) of Non-Automatic Monitoring Sites

Figure 2.2 - Map of Llandeilo NO_2 Non-Automatic Monitoring Sites (AQMA)

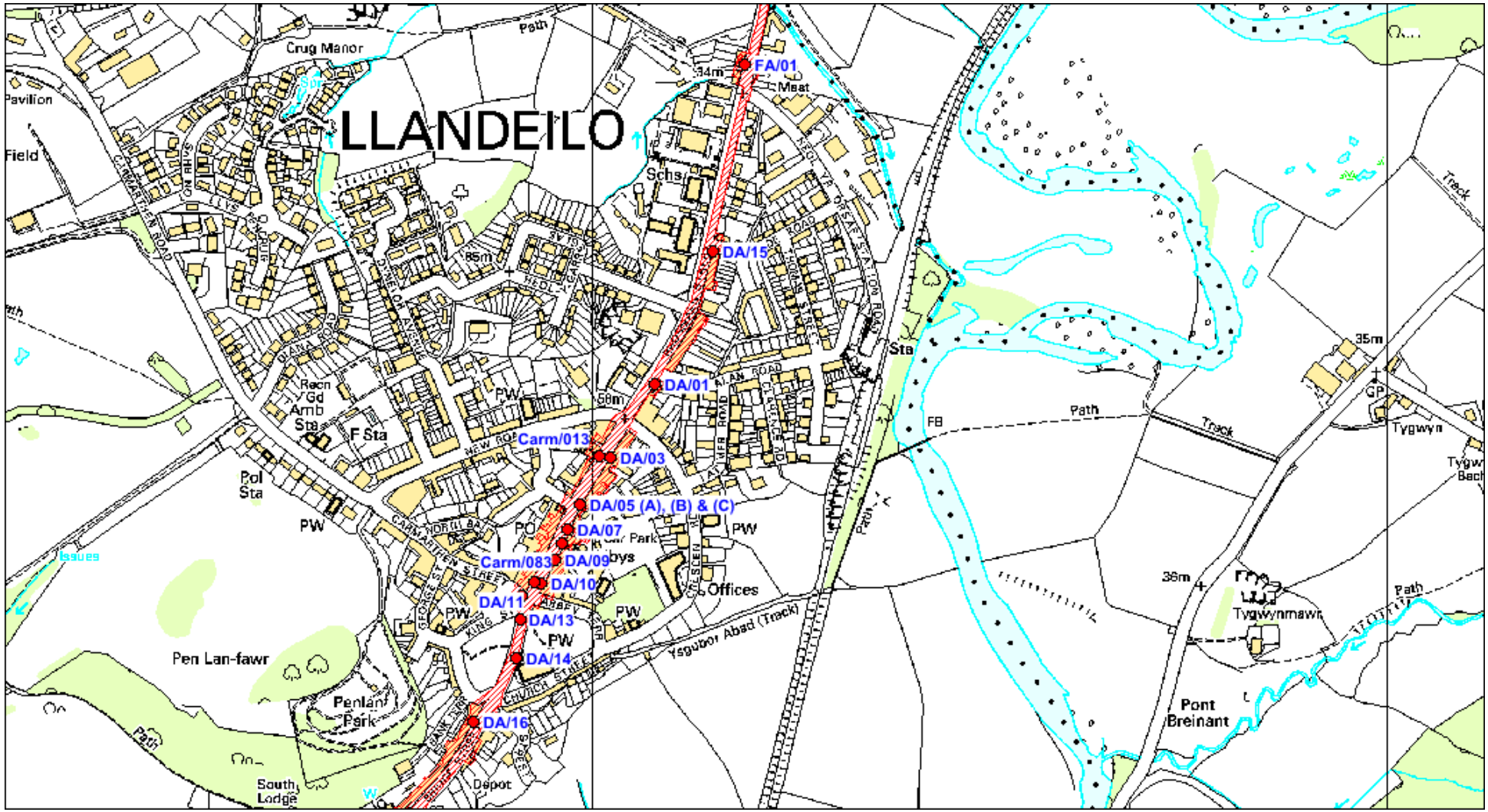


Figure 2.3 - Map of Carmarthen NO_2 Non-Automatic Monitoring Sites (AQMA)

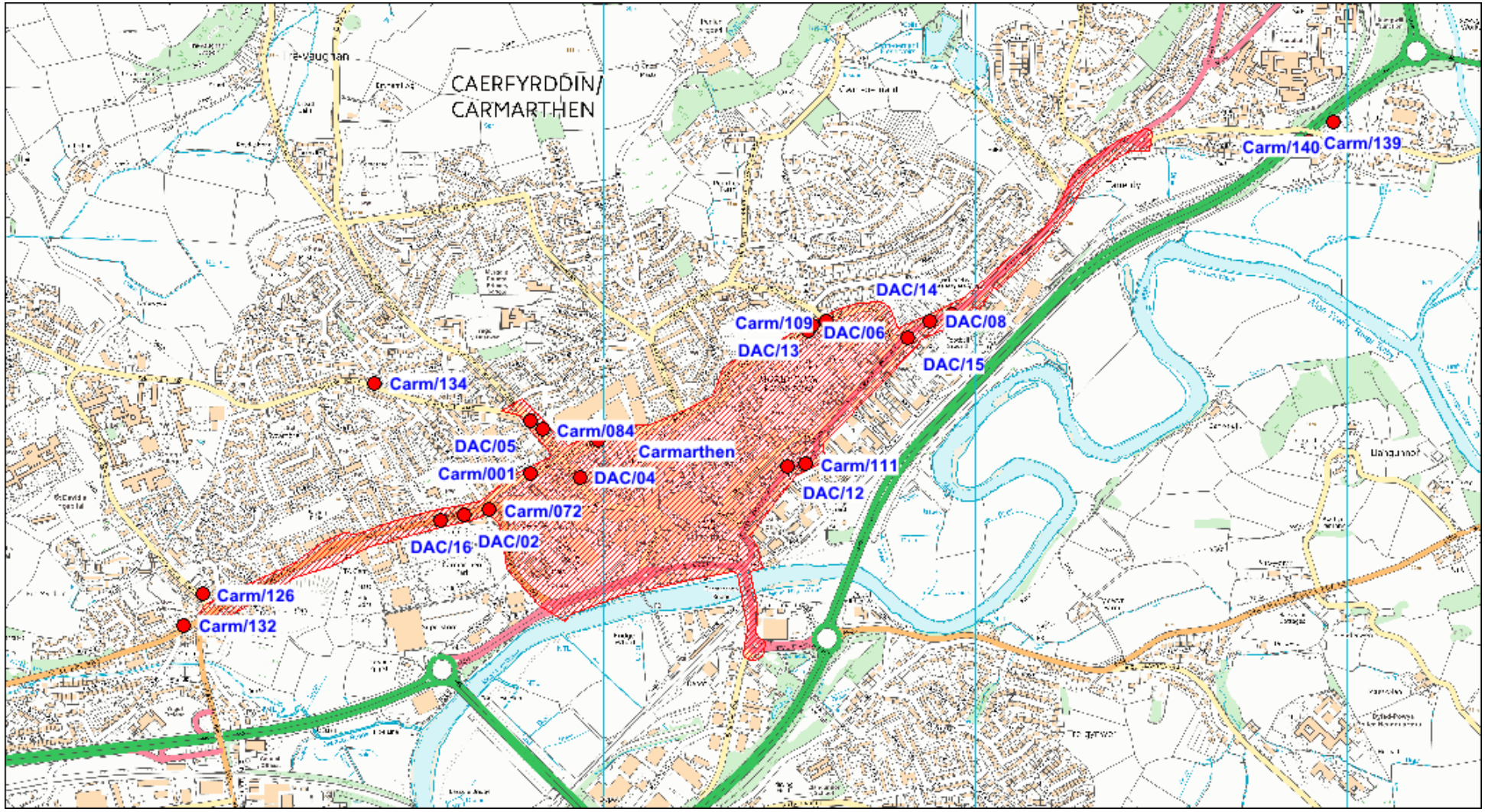


Figure 2.4 - Map of Llanelli NO_2 Non-Automatic Monitoring Sites (AQMA)

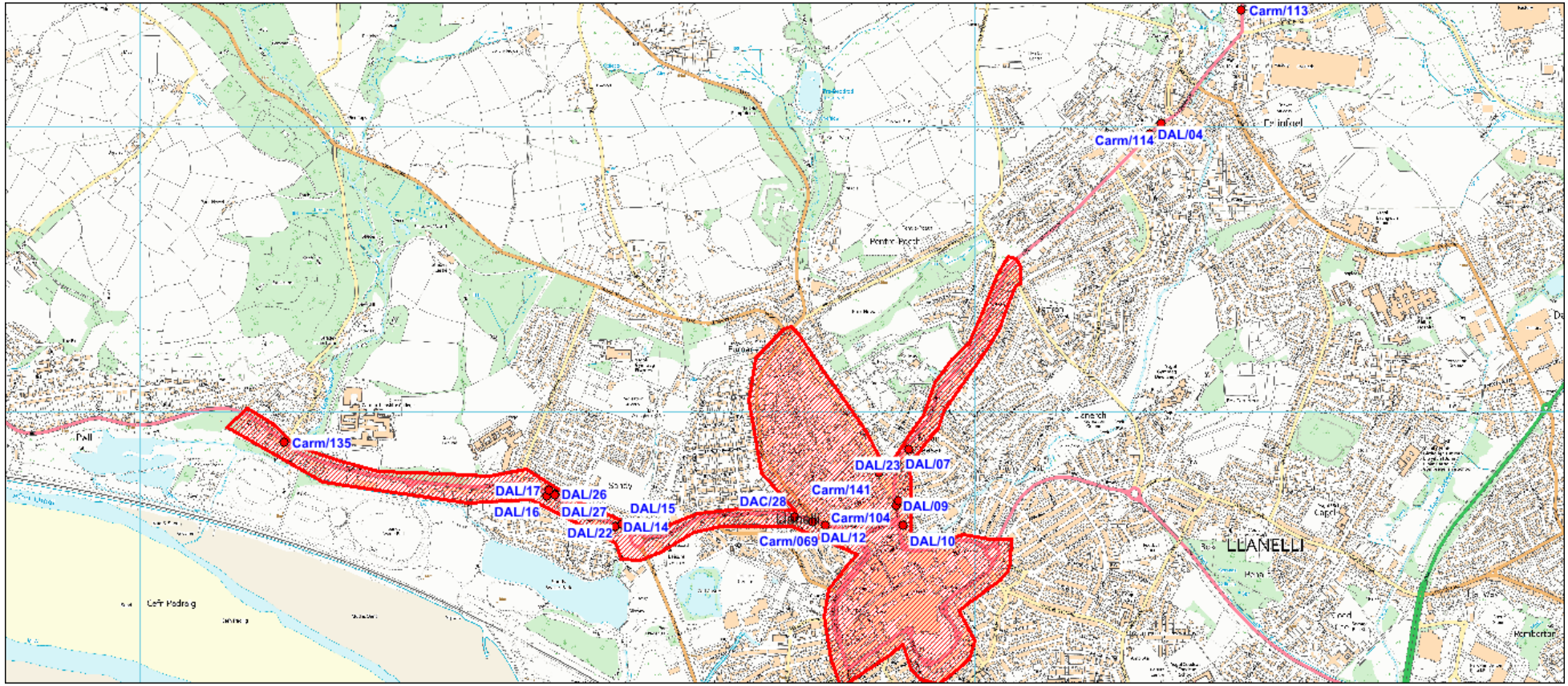
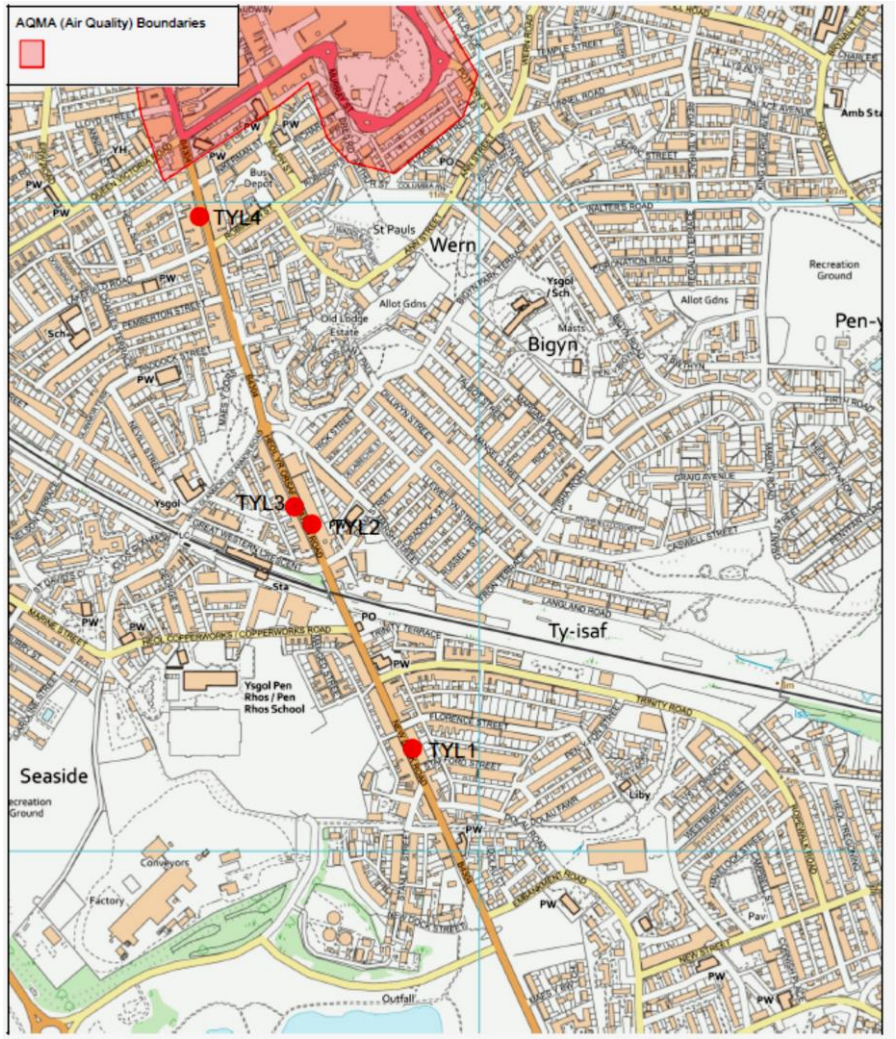


Figure 2.5 - Map of Llanelli NO_2 Non-Automatic Monitoring Sites (non-AQMA)



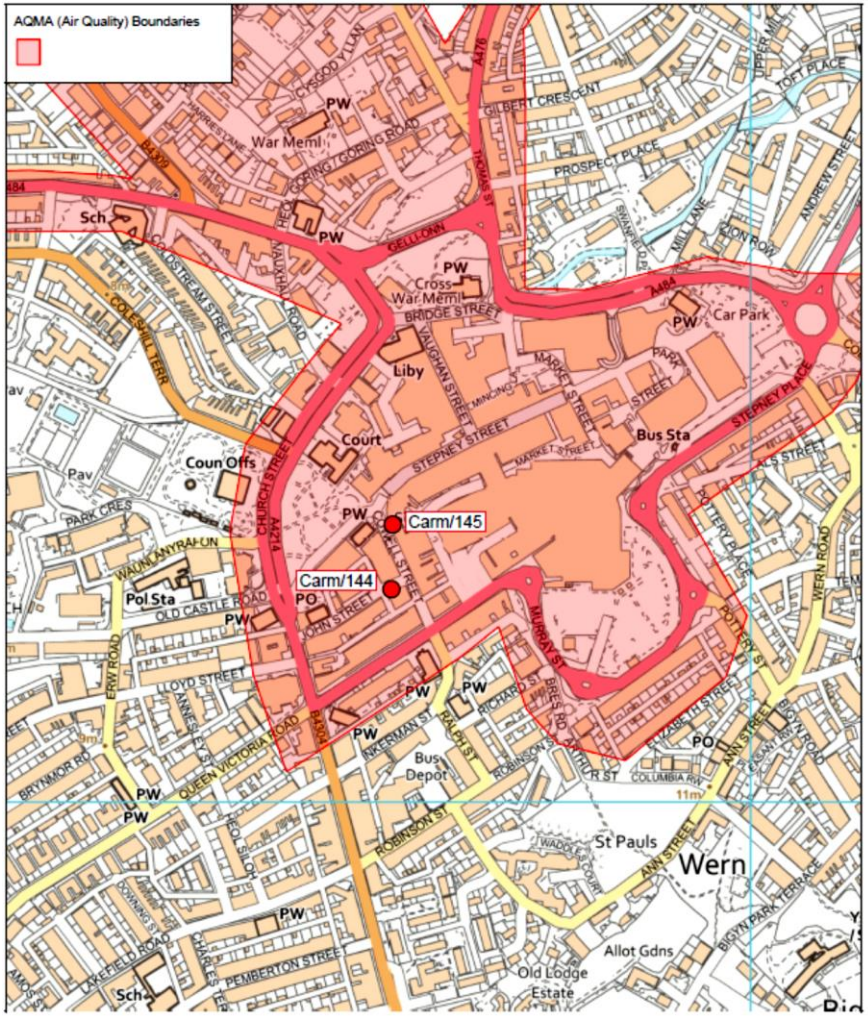


Figure 2.6 - Map of Llanelli NO_2 Non-Automatic Monitoring Sites (AQMA) (Road closure Screening Assessment)

Figure 2.7 - Map of Carmarthen Town Centre NO_2 Non-Automatic Monitoring Sites (screening)

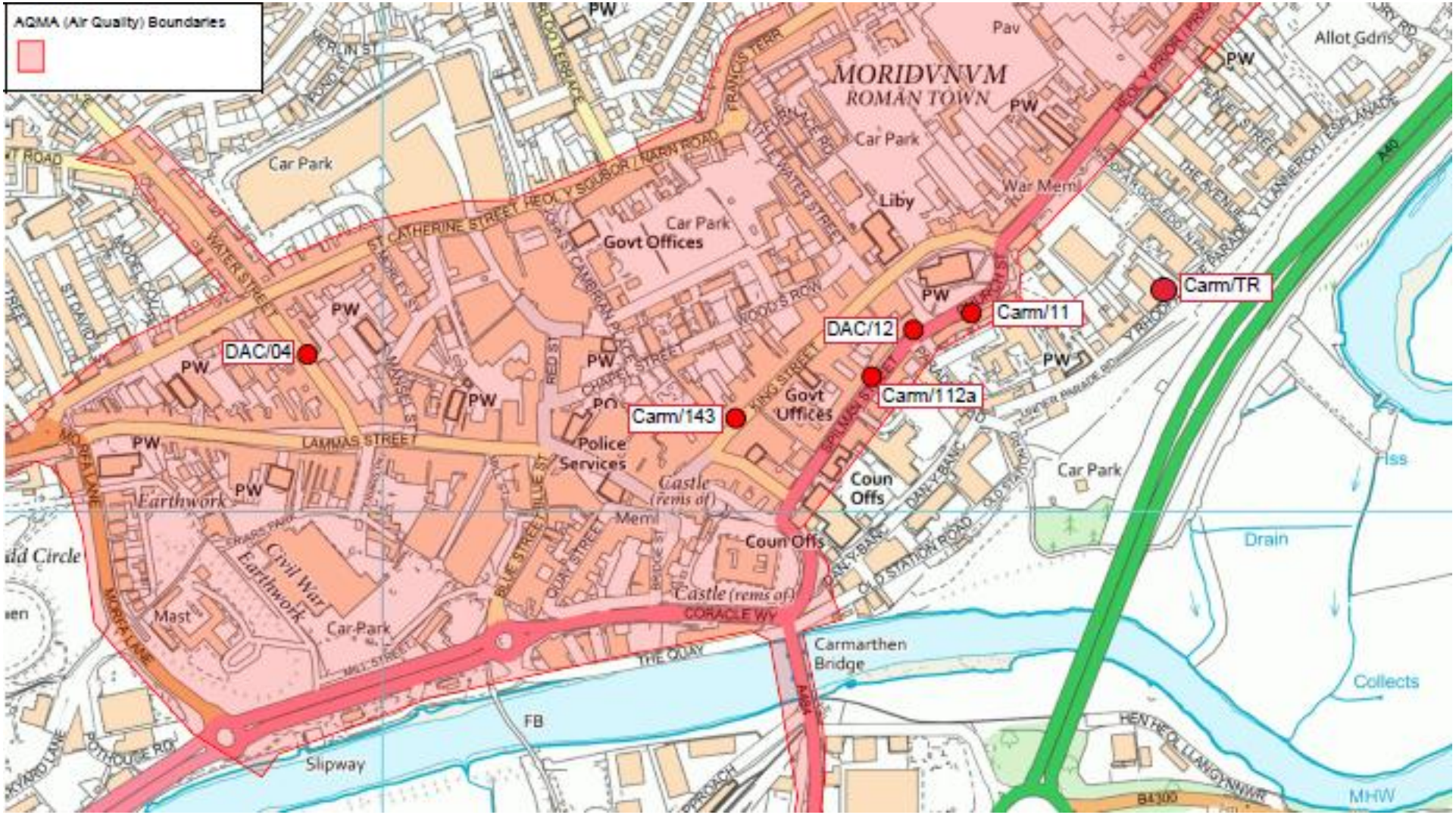


Figure 2.8 - Map of Burry Port NO_2 Non-Automatic Monitoring Sites

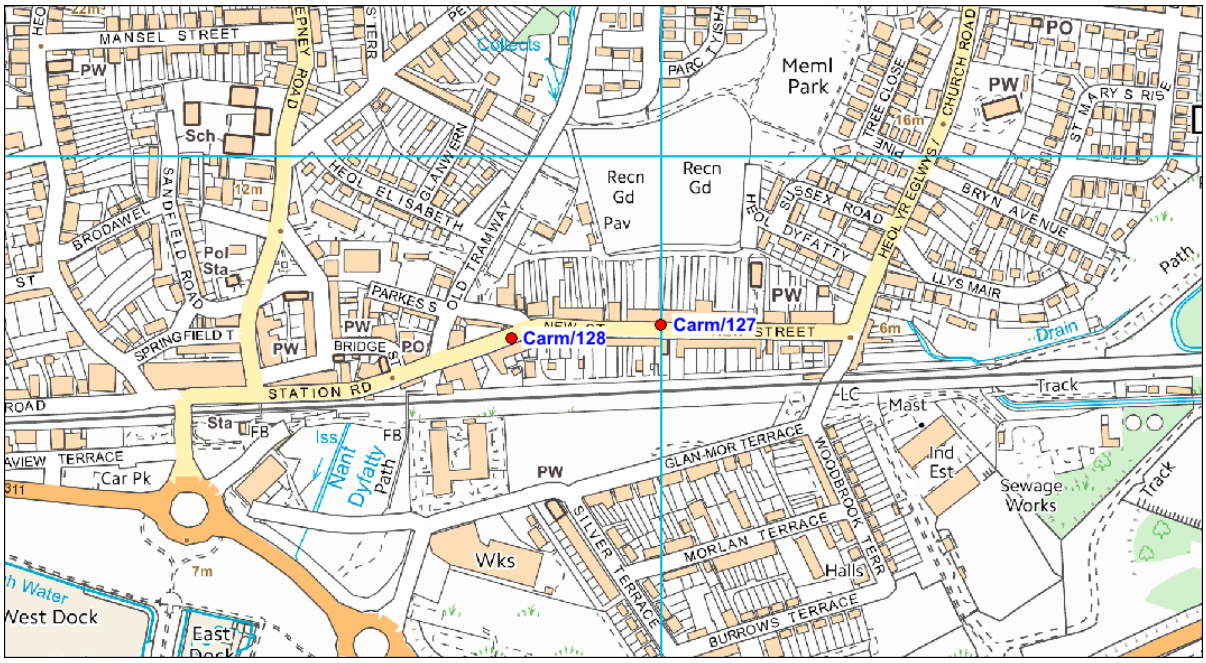


Figure 2.9 - Map of Ammanford NO_2 Non-Automatic Monitoring Sites

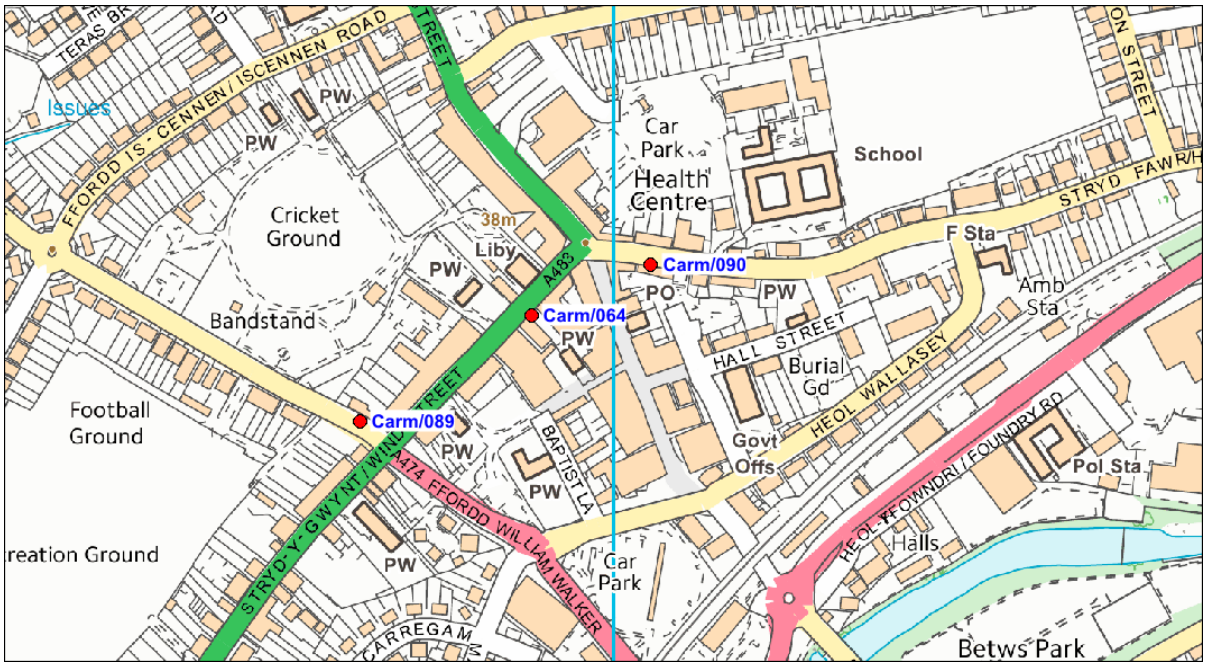


Figure 2.10 - Map of Llangennech, Llanelli NO_2 Non-Automatic Monitoring Sites

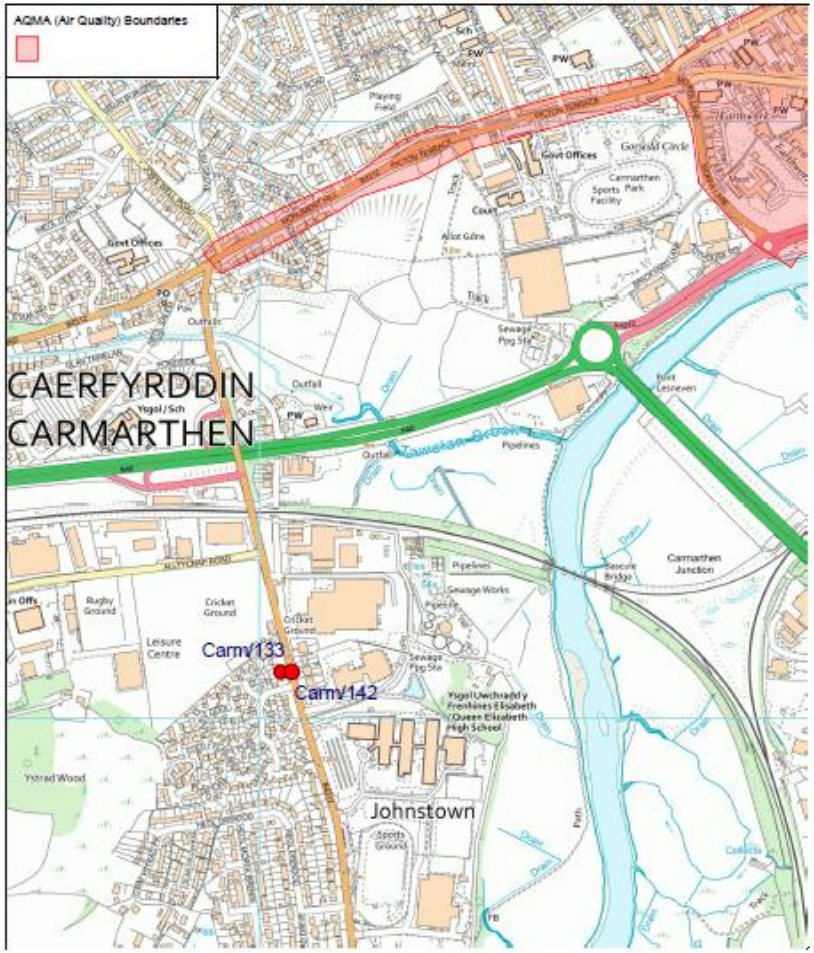


Figure 2.11 - Map of Johnstown, Carmarthen NO_2 Non-Automatic Monitoring Site

Figure 2.12 - Map of Cross Hands Economic Link Road NO_2 Non-Automatic Monitoring Sites

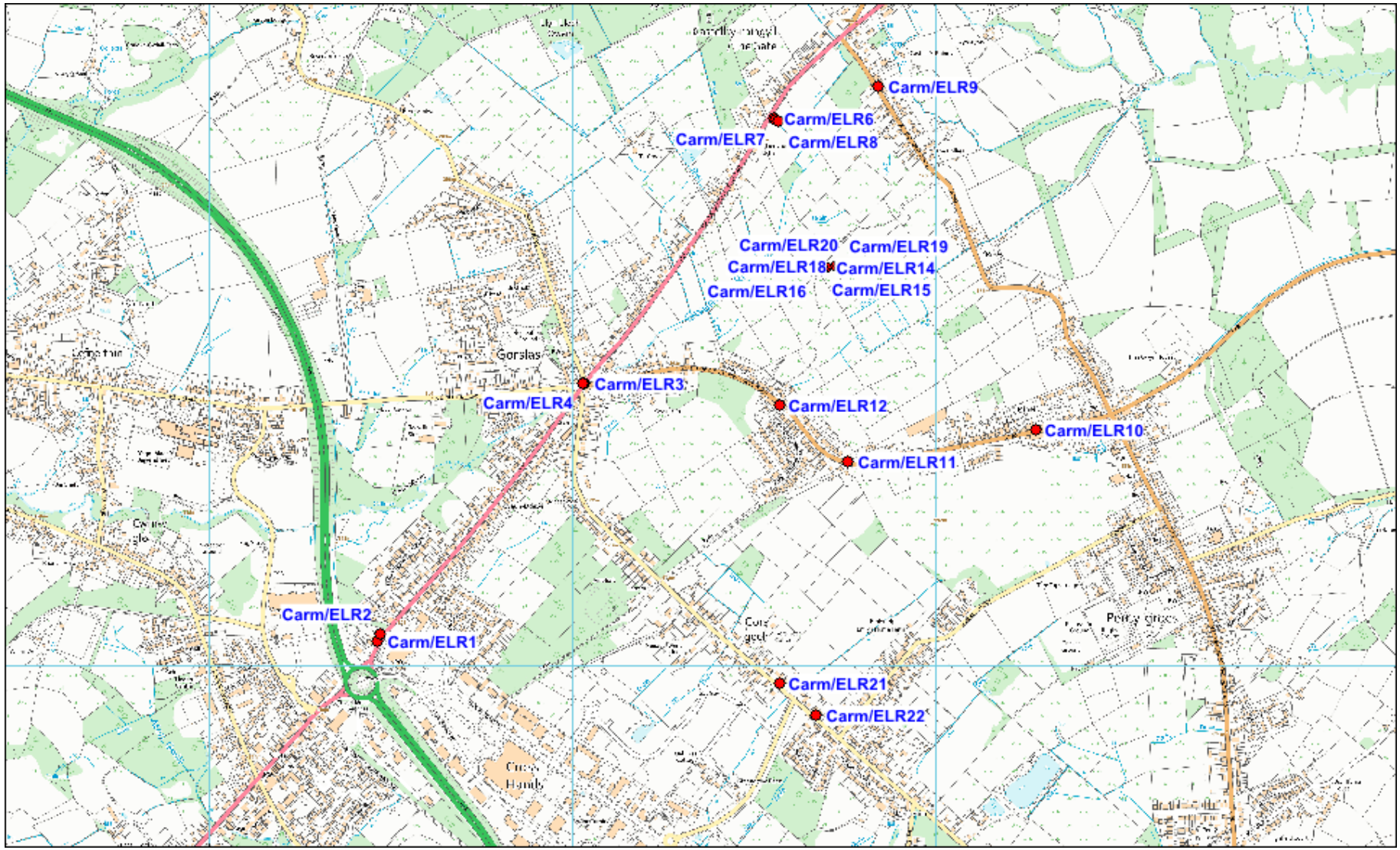


Figure 2.13 - Map of Richmond Park School, Carmarthen NO_2 Non-Automatic Monitoring Sites (Screening exercise)

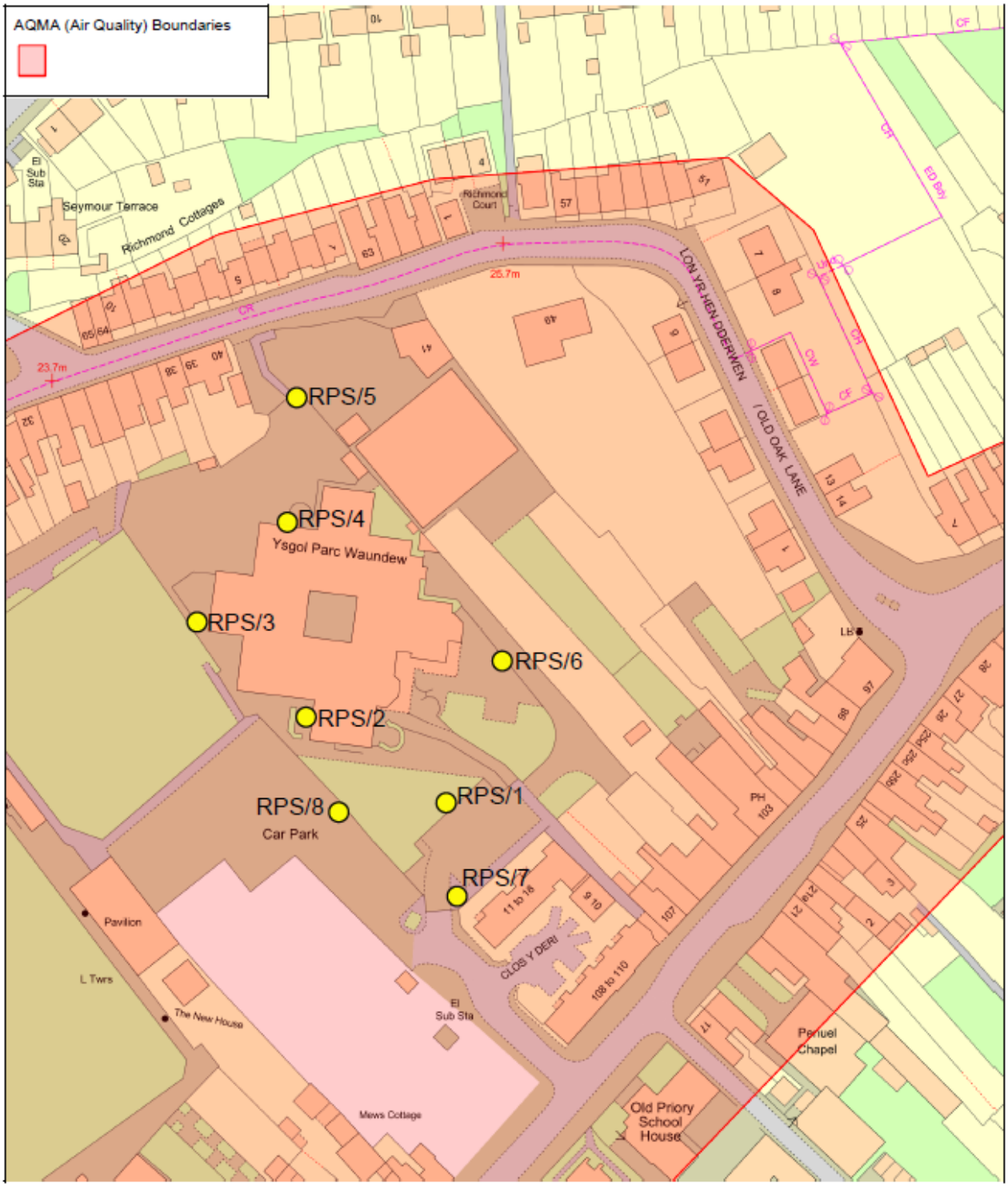


Figure 2.14 - Map of Ffairfach, Llandeilo NO_2 Non-Automatic Monitoring Sites (Screening exercise)

Figure 2.15 - Map of Pantyblodau, Ammanford,
NO_2 Non-Automatic Monitoring Site (Screening exercise)

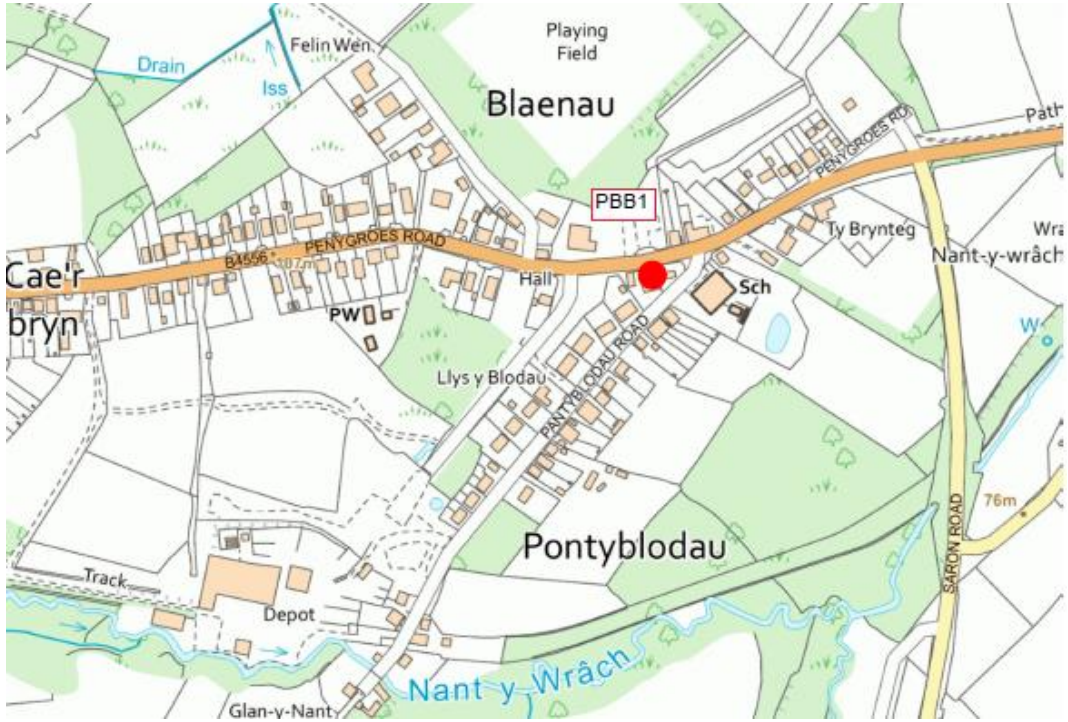


Figure 2.16 - Map of 16 Trostre Road, Llanelli
NO_2 Non-Automatic Monitoring Site (Screening exercise)

2.2 2021 Air Quality Monitoring Results

Table 2.2 – Annual Mean NO_2 Monitoring Results ($\mu g/m^3$)

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
Carm/089	Kerbside	Diffusion Tube	100	100.0	23.6	23.0	18.6	15.1	15.8
Carm/064	Roadside	Diffusion Tube	91.66666667	92.3	24.8	23.2	21.3	18.6	20.0
Carm/090	Roadside	Diffusion Tube	100	100.0	27.8	27.0	24.9	19.8	21.7
DAL/14	Roadside/Façade	Diffusion Tube	83.33333333	84.6	28.4	25.3	22.8	17.0	18.6
DAL/15	Roadside/Façade	Diffusion Tube	83.33333333	84.6	22.8	21.3	20.2	15.4	16.9
Carm/077	Roadside	Diffusion Tube	91.66666667	92.3	39.8	**41.7**	38.6	30.2	32.9
DAL/22	Roadside/Façade	Diffusion Tube	91.66666667	92.3	32.1	33.9	29.7	24.7	27.6
DAL/26	Roadside/Façade	Diffusion Tube	100	100.0	22.3	22.8	20.7	15.3	17.2
DAL/27	Roadside	Diffusion Tube	83.33333333	82.7	27.2	26.2	24.3	17.9	20.5
DAL/16	Roadside/Façade	Diffusion Tube	91.66666667	92.3	21.7	22.6	19.8	11.1	15.4
DAL/17	Roadside/Façade	Diffusion Tube	100	100.0	22.9	22.8	21.6	14.6	18.1
Carm/141	Roadside/Façade	Diffusion Tube	91.66666667	92.3	30.0	26.1	24.0	18.9	21.4
DAL/07	Kerbside	Diffusion Tube	83.33333333	84.6	**47.4**	**44.4**	**41.2**	31.6	37.4
DAL/23	Roadside/Façade	Diffusion Tube	100	100.0	20.9	22.2	20.1	15.8	17.4

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2021 (%) [2]	2017	2018	2019	2020	2021
DAL/09	Roadside/Façade	Diffusion Tube	100	100.0	**45.5**	38.5	37.6	31.5	34.4
Carm/104	Roadside/Façade	Diffusion Tube	91.66666667	90.4	35.9	36.4	32.7	25.6	28.5
DAL/10	Roadside/Façade	Diffusion Tube	91.66666667	92.3	34.3	33.7	31.6	24.7	25.4
Carm/069	Kerbside	Diffusion Tube	91.66666667	90.4	37.6	35.0	33.2	26.6	28.0
DAL/12	Kerbside	Diffusion Tube	100	100.0	30.2	27.9	27.4	20.2	22.3
DAL/28	Roadside	Diffusion Tube	91.66666667	92.3	-	24.9	20.4	17.2	18.4
DAL/04	Roadside	Diffusion Tube	58.33333333	57.7	31.0	30.4	26.6	21.2	21.2
Carm/114	Roadside	Diffusion Tube	83.33333333	84.6	35.0	32.9	30.8	24.0	25.0
Carm/113	Roadside	Diffusion Tube	91.66666667	92.3	36.8	33.9	31.5	22.6	24.3
Carm/135	Roadside/Façade	Diffusion Tube	100	100.0	28.4	25.7	23.6	16.9	21.0
TYL1	Roadside	Diffusion Tube	100	100.0	-	-	-	16.2	17.6
TYL2	Roadside	Diffusion Tube	66.66666667	48.1	-	-	-	14.6	14.0
TYL3	Roadside	Diffusion Tube	83.33333333	42.3	-	-	-	14.4	16.0
TYL4	Roadside	Diffusion Tube	91.66666667	92.3	-	-	-	14.5	15.7
Carm/144	Roadside	Diffusion Tube	83.33333333	82.7	-	-	-	10.3	9.7
Carm/145	Kerbside	Diffusion Tube	100	100.0	-	-	-	10.9	11.2
DAC/06	Kerbside	Diffusion Tube	91.66666667	82.7	30.4	27.0	28.3	21.8	21.9
DAC/13	Kerbside	Diffusion Tube	91.66666667	82.7	33.1	31.1	29.9	22.5	23.7

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2021 (%) [2]	2017	2018	2019	2020	2021
Carm/109	Kerbside	Diffusion Tube	100	90.4	35.8	36.9	32.4	25.2	27.0
DAC/08	Roadside	Diffusion Tube	91.66666667	82.7	**56.9**	**51.2**	**46.9**	37.2	38.8
DAC/14	Roadside	Diffusion Tube	100	90.4	34.0	32.4	30.8	21.6	23.8
DAC/15	Roadside	Diffusion Tube	100	90.4	30.3	27.6	25.7	20.1	19.7
Carm/111	Roadside	Diffusion Tube	100	90.4	32.4	30.3	28.6	21.4	20.8
DAC/12	Roadside/Façade	Diffusion Tube	100	82.7	34.2	31.5	29.8	20.2	23.4
DAC/04	Kerbside/Façade	Diffusion Tube	70	57.7	21.6	23.1	21.2	16.4	16.0
Carm/072	Roadside	Diffusion Tube	91.66666667	92.3	30.0	30.0	28.0	22.6	23.0
DAC/02	Kerbside	Diffusion Tube	100	100.0	**41.4**	38.3	**40.0**	29.6	31.9
DAC/16	Roadside/Façade	Diffusion Tube	91.66666667	92.3	37.2	37.9	32.8	26.2	28.4
Carm/001	Roadside	Diffusion Tube	100	100.0	31.9	30.9	27.7	21.6	22.8
Carm/084	Kerbside	Diffusion Tube	91.66666667	92.3	33.1	32.3	27.6	22.4	26.4
DAC/05	Roadside/Façade	Diffusion Tube	75	75.0	32.9	32.4	31.5	23.0	26.3
Carm/106	Roadside/Façade	Diffusion Tube	91.66666667	92.3	37.8	34.4	33.1	24.2	24.8
Carm/134	Other/Façade	Diffusion Tube	100	100.0	12.1	12.5	11.5	8.5	9.5
Carm/126	Roadside	Diffusion Tube	100	100.0	22.5	22.2	19.6	15.9	17.2
Carm/132	Roadside/Façade	Diffusion Tube	91.66666667	92.3	17.1	16.8	15.5	12.1	14.2
Carm/133	Roadside/Façade	Diffusion Tube	100	100.0	13.0	13.6	12.8	9.3	10.5

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2021 (%) [2]	2017	2018	2019	2020	2021
Carm/142	Roadside	Diffusion Tube	83.33333333	82.7	-	17.1	15.3	11.8	13.1
Carm/112a	Roadside	Diffusion Tube	100	100.0	-	-	-	19.8	20.5
Carm/143	Roadside	Diffusion Tube	75	75.0	-	-	-	12.7	11.0
FA/01	Roadside	Diffusion Tube	100	100.0	15.1	14.9	13.6	10.7	10.5
DA/15	Roadside/Façade	Diffusion Tube	91.66666667	92.3	25.2	22.9	22.0	17.4	16.3
DA/01	Roadside	Diffusion Tube	100	100.0	24.2	23.5	20.4	15.8	16.7
DA/03	Roadside/Façade	Diffusion Tube	100	100.0	25.2	23.5	22.1	18.1	17.4
Carm/013	Kerbside	Diffusion Tube	91.66666667	92.3	33.7	30.3	28.6	22.5	22.0
DA/05 (A), (B) & (C)	Roadside/Façade	Diffusion Tube	100	100.0	34.6	34.6	30.3	24.4	26.6
DA/07	Roadside/Façade	Diffusion Tube	100	100.0	38.7	37.9	33.3	26.2	28.2
Carm/083	Roadside	Diffusion Tube	100	100.0	39.5	**40.1**	36.8	27.4	31.7
DA/09	Roadside/Façade	Diffusion Tube	100	100.0	**42.0**	**40.1**	38.6	29.4	32.2
DA/10	Kerbside/Façade	Diffusion Tube	91.66666667	90.4	38.9	**41.3**	34.8	24.3	29.5
DA/11	Roadside/Façade	Diffusion Tube	100	100.0	38.4	35.6	34.1	24.4	28.2
DA/12	Roadside/Façade	Diffusion Tube	83.33333333	84.6	30.3	21.2	19.5	12.3	14.6
DA/13	Kerbside	Diffusion Tube	100	100.0	34.8	33.8	31.7	22.0	24.2
DA/14	Roadside	Diffusion Tube	100	100.0	22.9	22.2	22.7	17.2	19.0
DA/16	Roadside/Façade	Diffusion Tube	100	100.0	33.4	31.4	27.1	21.4	23.9

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2021 (%) [2]	2017	2018	2019	2020	2021
Carm/127	Kerbside	Diffusion Tube	100	100.0	12.0	12.6	11.6	9.0	9.5
Carm/128	Kerbside	Diffusion Tube	100	100.0	15.4	14.7	14.0	11.1	12.0
LLG2	Roadside	Diffusion Tube	91.66666667	92.3	-	-	18.3	15.7	15.2
LLG3	Roadside	Diffusion Tube	100	100.0	-	-	18.0	13.3	13.9
Carm/ELR1	Roadside	Diffusion Tube	91.66666667	90.4	**41.3**	34.3	33.0	24.0	24.8
Carm/ELR2	Roadside/Façade	Diffusion Tube	75	75.0	23.3	22.4	20.3	16.5	16.7
Carm/ELR3	Roadside	Diffusion Tube	66.66666667	65.4	19.1	17.3	16.5	12.0	14.1
Carm/ELR4	Roadside/Façade	Diffusion Tube	100	100.0	15.7	15.0	14.0	11.1	11.2
Carm/ELR9	Roadside	Diffusion Tube	100	100.0	8.2	7.7	7.2	5.3	5.6
Carm/ELR10	Roadside	Diffusion Tube	50	7.7	13.3	12.6	12.5	8.7	-
Carm/ELR11	Roadside	Diffusion Tube	83.33333333	82.7	10.9	9.6	9.8	7.5	8.0
Carm/ELR12	Kerbside	Diffusion Tube	91.66666667	92.3	14.1	12.2	12.2	9.4	9.9
Carm/ELR21	Roadside	Diffusion Tube	91.66666667	90.4	11.3	10.2	9.7	7.6	8.6
Carm/ELR22	Roadside	Diffusion Tube	83.33333333	84.6	16.9	15.8	15.2	11.8	12.7
RPS/1	Other	Diffusion Tube	100	100.0	-	-	-	8.7	8.9
RPS/2	Other	Diffusion Tube	75	75.0	-	-	-	7.3	8.3
RPS/3	Other	Diffusion Tube	100	100.0	-	-	-	8.2	8.3
RPS/4	Other	Diffusion Tube	100	100.0	-	-	-	7.1	8.2

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
RPS/5	Other	Diffusion Tube	100	100.0	-	-	-	8.6	9.5
RPS/6	Other	Diffusion Tube	83.33333333	84.6	-	-	-	8.5	8.7
RPS/7	Other	Diffusion Tube	91.66666667	90.4	-	-	-	8.9	9.1
RPS/8	Other	Diffusion Tube	91.66666667	92.3	-	-	-	8.2	9.4
FA/04(A)	Roadside	Diffusion Tube	90.90909091	84.6	-	-	-	-	8.9
FA/06(A)	Roadside	Diffusion Tube	90.90909091	84.6	-	-	-	-	10.5
FA/03(A)	Roadside	Diffusion Tube	100	92.3	-	-	-	-	14.2
FA/07(A)	Roadside	Diffusion Tube	90.90909091	84.6	-	-	-	-	5.8
ELR/10(B)	Roadside	Diffusion Tube	90	76.9	-	-	-	-	9.1
PBB1	Other	Diffusion Tube	100	50.0	-	-	-	-	5.7
TYL5	Roadside	Diffusion Tube	80	69.2	-	-	-	-	14.3
Carm/TR	Roadside	Diffusion Tube	87.5	57.7	-	-	-	-	9.3
Carm/146	Roadside	Diffusion Tube	100	34.6	-	-	-	-	15.1

Notes:

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

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

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

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

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

Figure 2.17 – Trends in Annual Mean NO_2 Concentrations

Figure 2.18 – Carmarthen AQMA Trends in Annual Mean NO_2 Concentrations

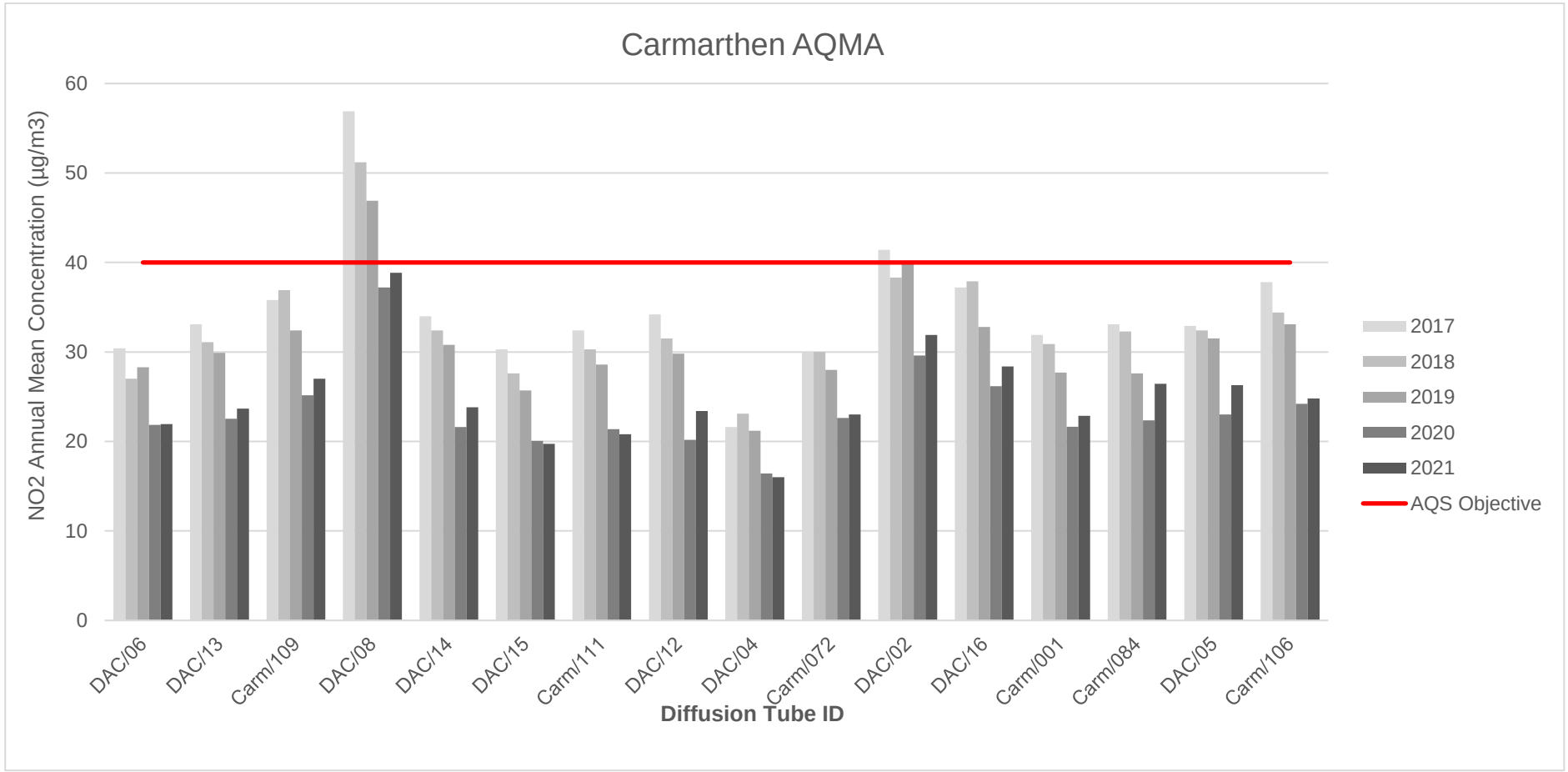


Figure 2.19– Llandeilo Trends in Annual Mean NO_2 Concentrations

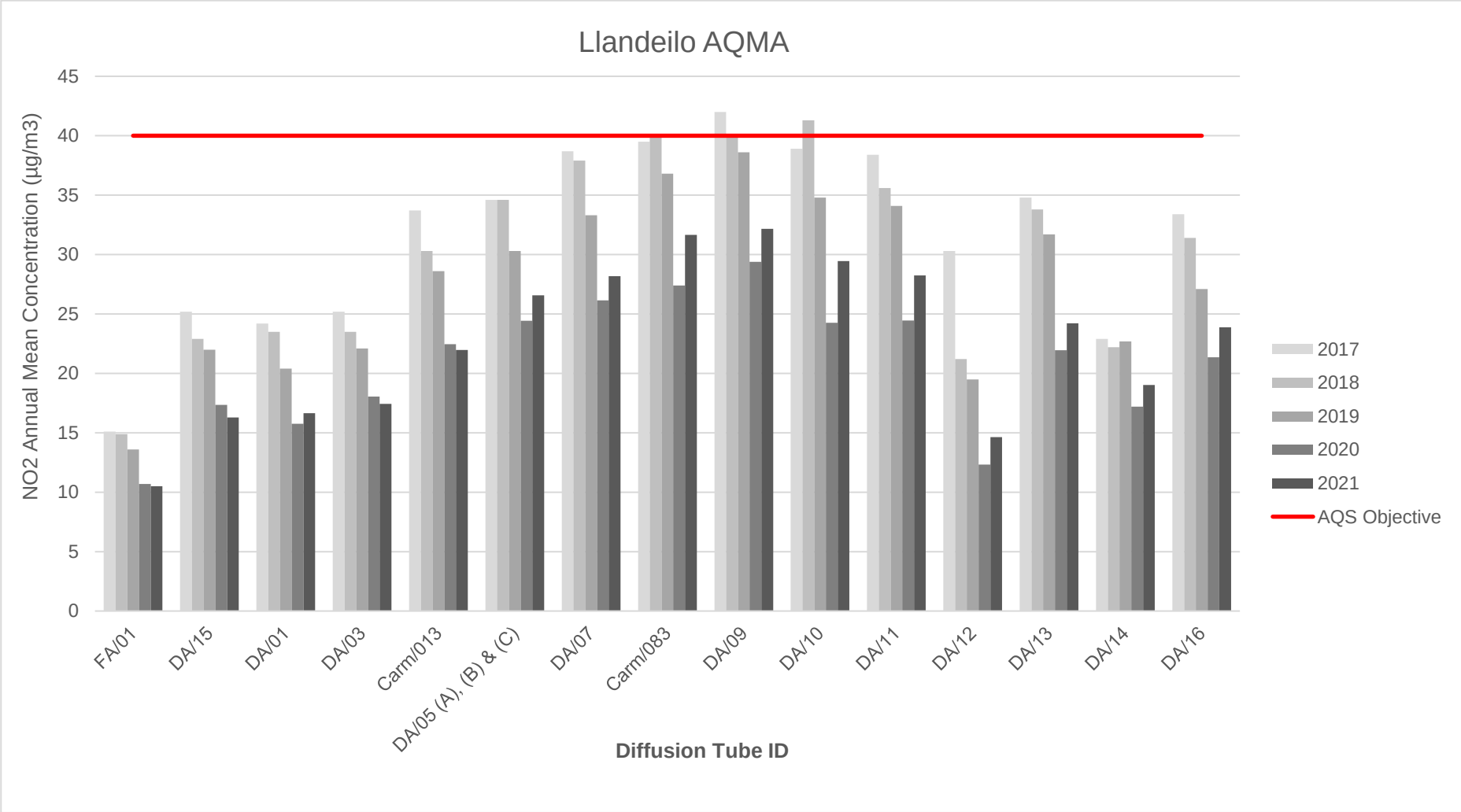
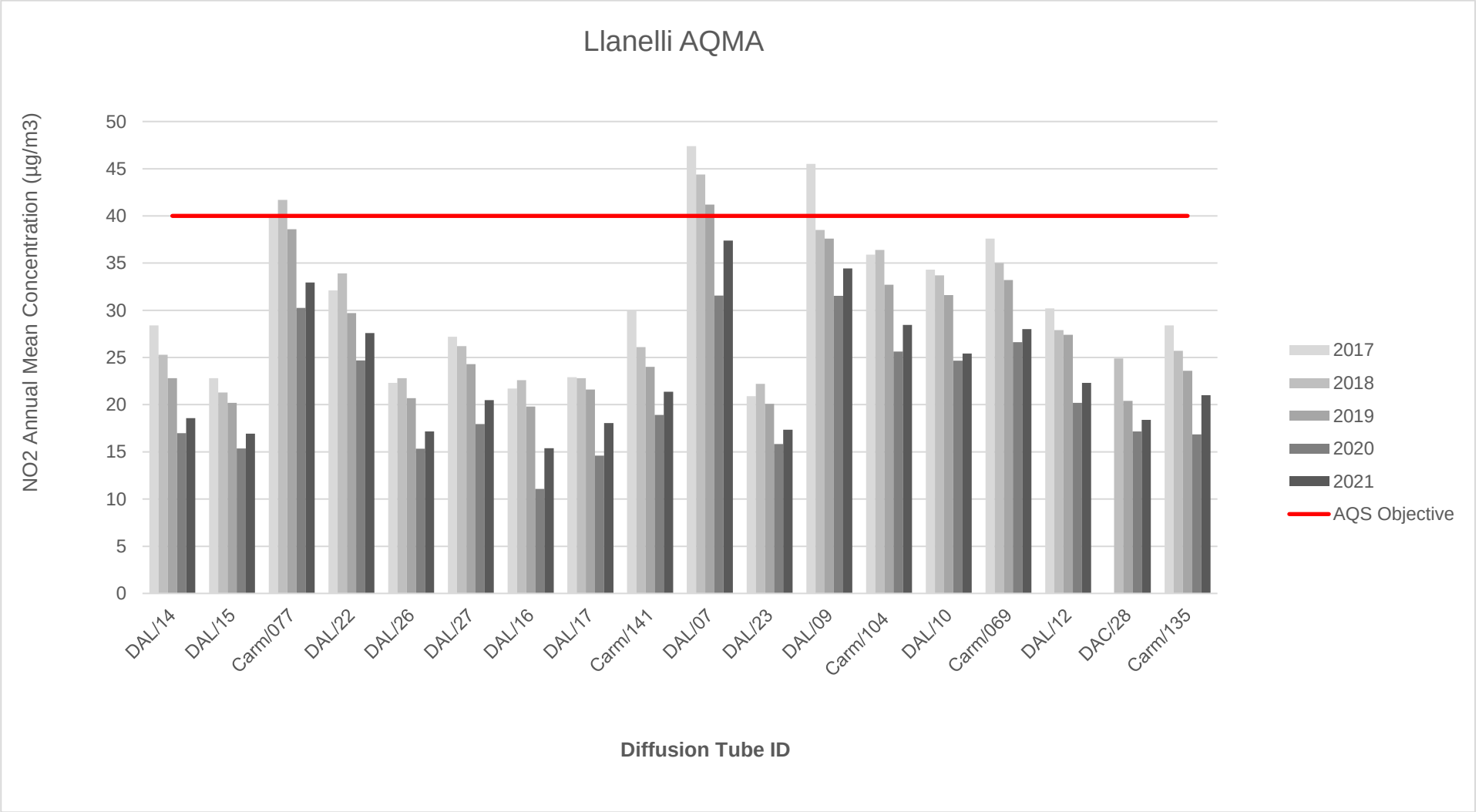
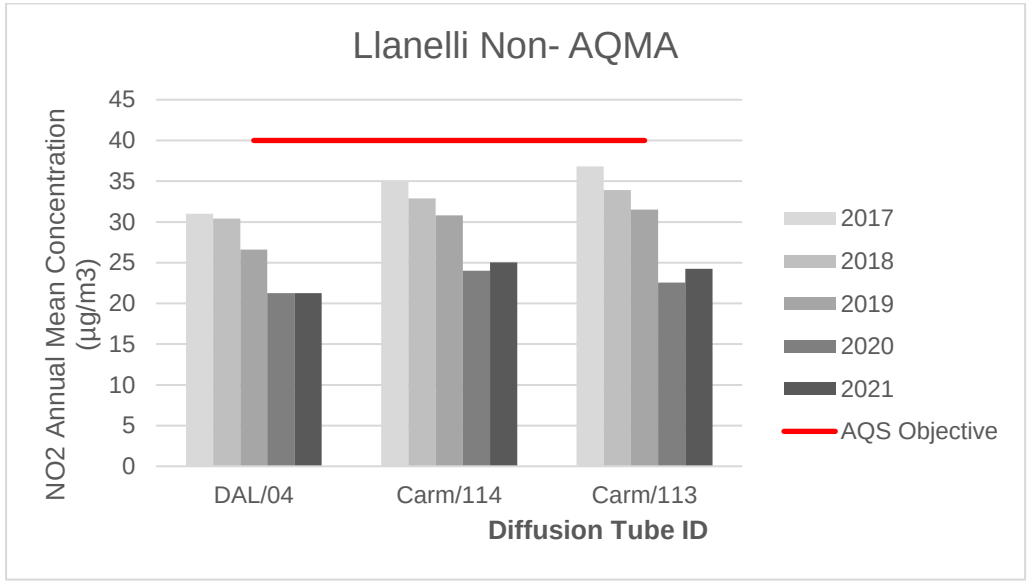
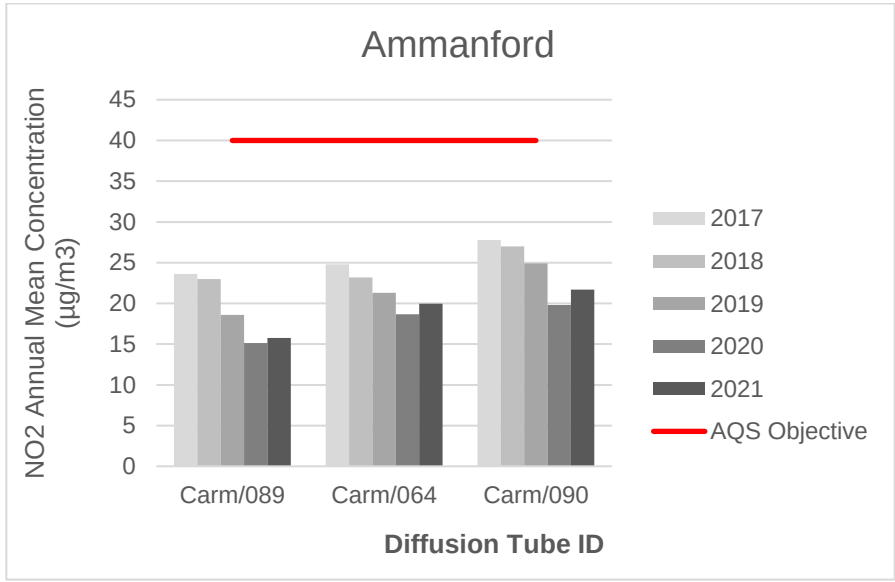


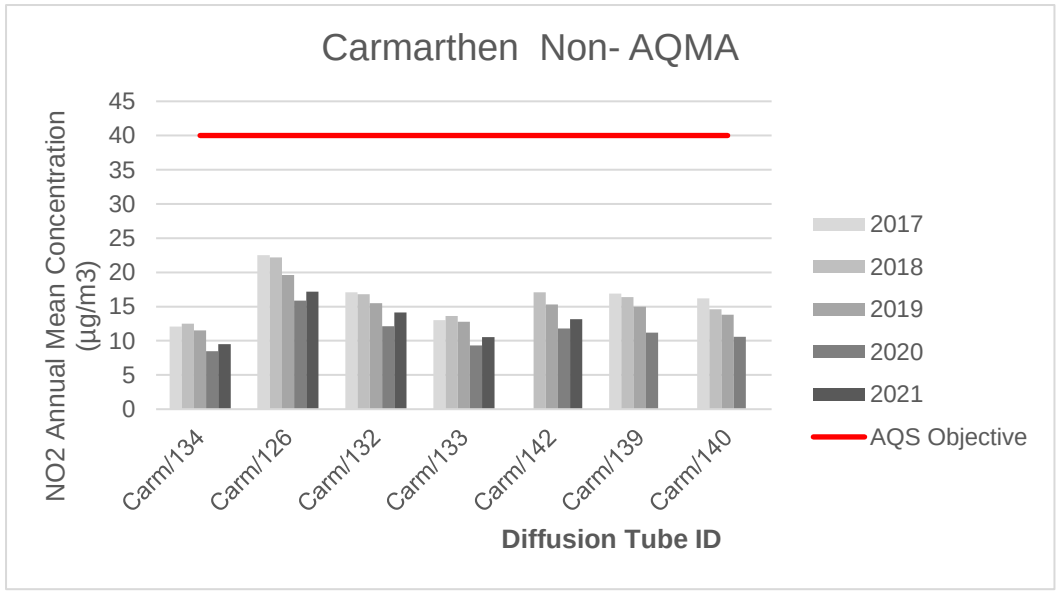
Figure 2.20– Llanelli Trends in Annual Mean NO_2 Concentrations

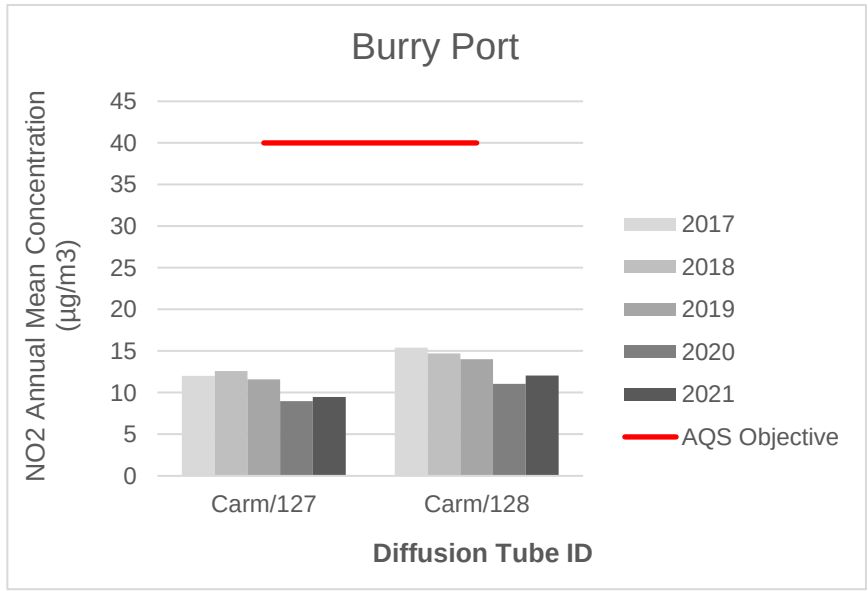


Figures 2.21 – Non- AQMA Trends in Annual Mean NO_2 Concentrations









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

Monitoring periods and valid data capture

A network of 87 NO_2 diffusion tube monitoring in Ammanford, Carmarthen, Llanelli, Llangennech, Burry Port, Llandeilo and Cross Hands was set up for the full calendar year, with tube changes coinciding with the recommended exposure periods suggested by the LAQM helpdesk. Fifty-two of these sites experienced missing or non-exposed tubes which lowered the percentage of valid data that was captured for the full calendar year. This is illustrated on Table 2.2 – Annual Mean NO_2 Monitoring Results ($\mu g/m^3$). Despite this reduction in valid data capture, the bias adjusted annual mean did not require annualisation for forty-eight of the sites because more than 75% of the full calendar year was captured.

Ten of the ninety-eight total monitoring sites (including shorter period screening exercises) however, captured less than 75% valid data. One site referenced Carm/ELR10 only captured 1 month and was there unable to be subject to annualisation, therefore nine sites needed the results to be annualised.

It was necessary to annualise the results for nine sites because data capture for these sites was less than 75%, this included TYL2, TYL3, TYL5, DAL/04, DAC/04, Carm/ELR3, PBB1, Carm/TR and Carm/146. Eleven sites in total had a shorter monitoring period than the full calendar year. This included nine new tube sites within six screening exercises.

Two existing sites were removed early and replaced by two new sites located nearby because the original site locations became inaccessible or unsuitable; TYL3 was replaced by TYL5 and Carm/ELR10 was replaced by Carm/ELR10(B).

In March a new diffusion tube site PBB1 was set up to screen the impact of a speed bump that had been newly installed in Pantyblodau Road, Blaenau, Ammanford. Concerns were raised regarding fumes from heavy good vehicles travelling over the bumps. This Screening exercise was carried out for 6 months between March to August 2021. Results were annualised accordingly.

A new site was set up at Ty Rhys, Carmarthen (Carm/TR) following concerns about the air quality in the area with regards to a nearby carpark and bypass. The site is located outside of the AQMA boundary. An eight- month screening exercise was carried out between May

and December, however only 7 months valid data was captured, and the results were also annualised.

A new site was set up in 16 Trostre Road, Llanelli (Carm/146) following concerns raised about the volume of traffic and air quality impacting on residents' health. Only four months valid data was captured between September to December although it was still possible to annualise the data.

Three further sites in the County experienced a shorter monitoring period simply because some tubes were missing and the sites were either temporarily removed due to structural works or temporarily inaccessible to expose. This included sites DAL/04 (51 Panteg Road, Llanelli) and DAC/04 (Water Street, Carmarthen (Probation Office), which both had seven months valid data captured and Carm/ELR3 (Gorslas Sixways) which managed to capture 8 months valid data. The results were subsequently annualised.

Further details on the approach taken on annualising this data can be found in Appendix C: Diffusion Tube Annualisation and the annualised post data bias end result has been used in Table 2.2 – Annual Mean NO_2 Monitoring Results (µg/m^3) above.

Monitoring results exceeding / close to the Annual Air Quality Objective

There were no diffusion tube locations that exceeded the annual mean AQO in both 2020 and 2021, although two sites reported a borderline result above 35µg/m^3 for 2021. Those sites that have previously exceeded the AQO are detailed below with the relevant data presented in Table 2.2 – Annual Mean NO2 Monitoring Results (µg/m3)above. The raw data for 2021 can be found Table A.1. Appendix A: Quality Assurance / Quality Control (QA/QC) Data

Llanelli

It was reported that one site in Llanelli exceeded the AQO for 2019, this was 13 Felinfoel Road (DAL/07), which had exceeded the AQO in the previous seven years and although it has experienced decreases over the last few years from 47.4µg/m^3 (2017) to 44.4µg/m^3 (2018) to 41.2µg/m^3 (2019), 2020 was the first time were able to report compliance of the AQO, at 31.6µg/m^3. 2021 Results have increased to 37.4µg/m^3 and remain marginally compliant this year.

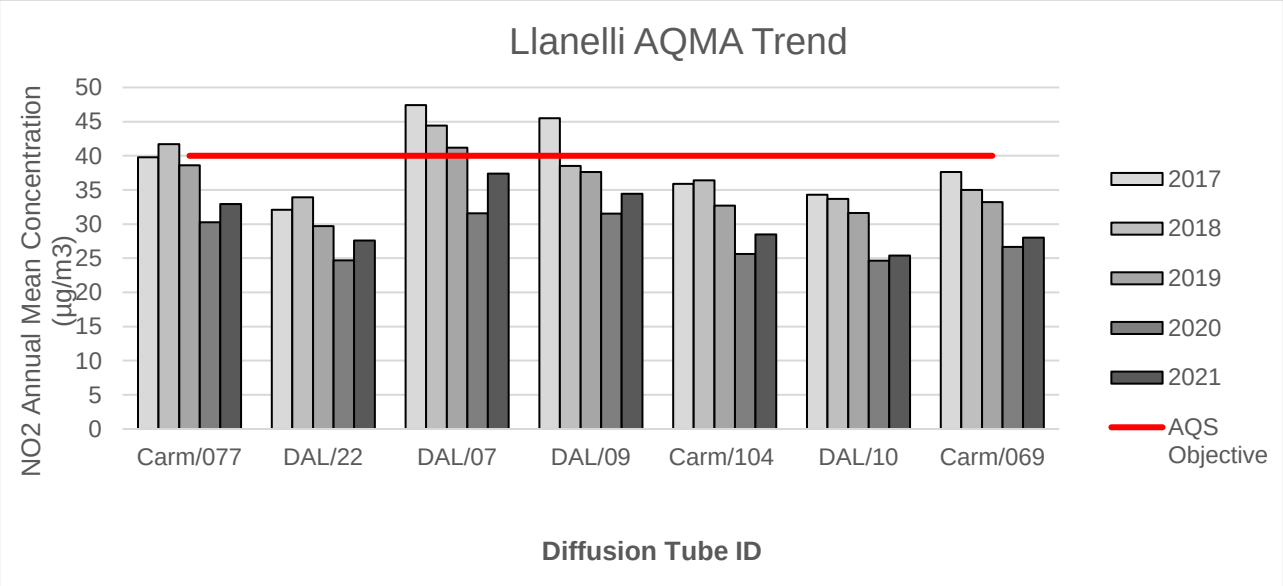
Thomas Street (Barnados) (DAL/09) is located approximately 140m downhill from 13 Felinfoel Rd, it last exceeded the AQO in 2017, and remained borderline in 2019 and 2018

after experiencing a decrease below the AQO for the first time in the previous five years. It had significantly reduced for 2020, reporting an annual average result similar to 13 Felinfoel Rd, with 31.5µg/m^3, however this year it has increased to 34.4 µg/m^3, although this is an improvement from pre-2020 years.

Carm/077 in Sandy Road (2) previously exceeded the AQO for the first time in 2018 after observing a gradual increase over three years, however during 2019 results remained borderline at 38.9µg/m^3. Notably, this site is located near the kerb and some meters away from the relevant receptor. In 2020, the annual average for this site reduced to 30.2µg/m^3 and only increase slightly to 32.9µg/m^3 for 2021.

The three above mentioned sites are the only monitoring sites in Llanelli to report an annual average greater than 30µg/m^3 for both 2020 and 2021.

Figure 2.22 : Five Year Trend in Llanelli AQMA (Highest NO_2 results)



All sites in Llanelli observed a marginal increase in NO_2, compared to last year but a definitive downward trend and this trend appears consistent across the whole monitoring network in Llanelli's AQMA.

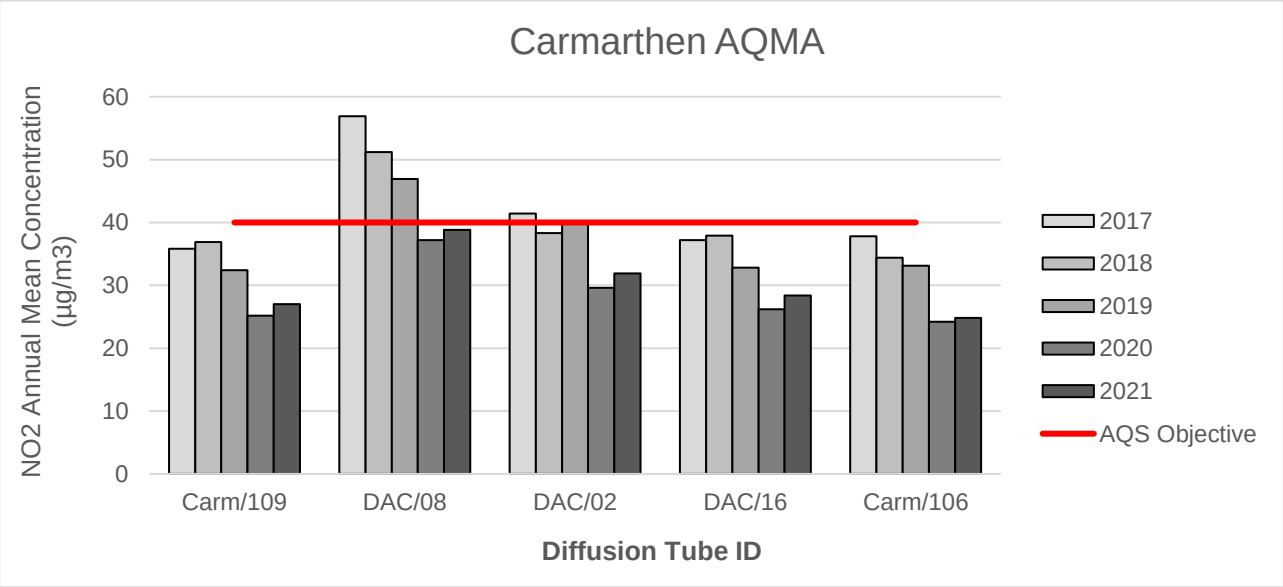
Carmarthen

In Carmarthen there were no exceedances of the annual AQO in 2020 or 2021 whereas two locations exceeded the AQO in 2019. They were 85 Priory Street (E) (DAC/08), which had exceeded the AQO for the eight years prior to 2020 but reduced from 46.9µg/m^3 in 2019 to 37.2µg/m^3 in 2020, and this year has reported a borderline result of 38.8 µg/m^3 . Secondly, 15 Park Terrace (DAC/02), which reported 38.3µg/m^3 in 2018, increased to 40µg/m^3 in 2019

and then reduced to 29.6µg/m^3 in 2020, and has remained compliant in 2021 with 31.9µg/m^3.

All the monitoring sites in Carmarthen have seen a reduction in concentration compared to 2019. The highest reading tube in the county was for the ninth-year running was 85 Priory Street (E)(DAC/08). The annual result was 38.8µg/m^3, which is decreasing steadily, reporting 46.9µg/m^3 (2019), 51.2µg/m^3 (2018) and 57µg/m^3 (2017). This was the only monitoring site in Carmarthen that reported an annual average result above 36µg/m^3. Similarly, to Llanelli, most sites within Carmarthen AQMA, experienced a reduction in NO_2 compared to previous years.

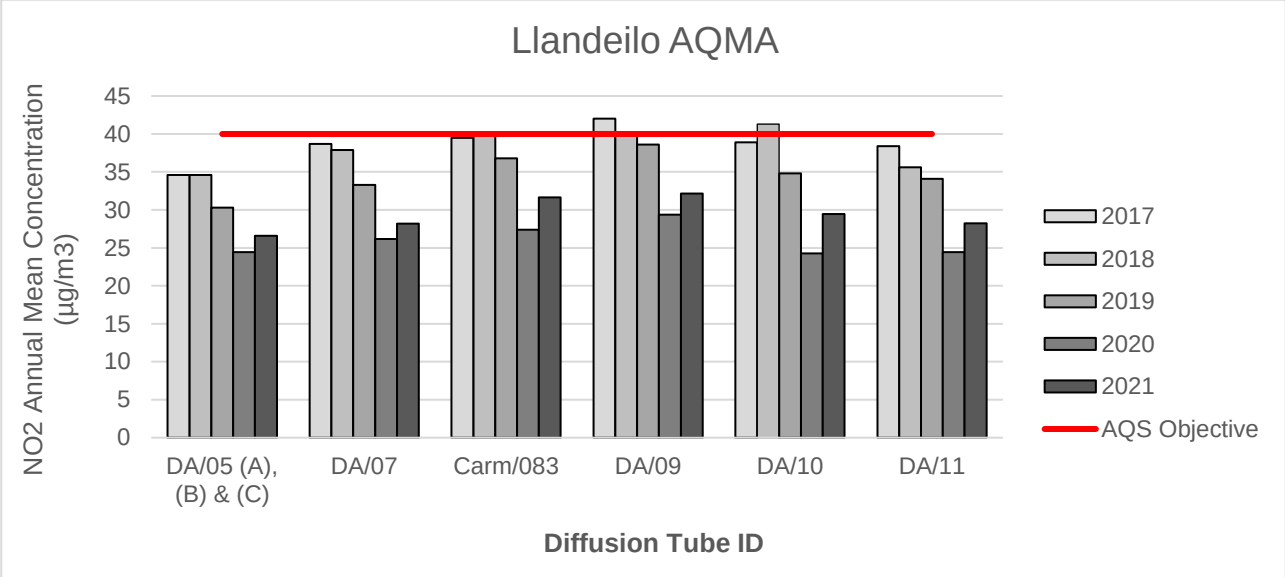
Figure 2.23 : Five Year Trend in Carmarthen AQMA (Highest NO_2 results)



Llandeilo

During 2019, 2020 and 2021 Llandeilo had no sites that exceeded the annual AQO, just two locations remained borderline during 2019, and all monitoring sites reported annual average results below 30µg/m^3 in 2020, however this year a slight increase in NO_2 resulted in three sites reporting a reading above 30µg/m^3, still no sites in Llandeilo are borderline compliant. This is a great improvement compared to 2018 where it was reported that three sites breached the AQO before any NO_2 fall off with distance calculations were conducted. They included 123 Rhosmaen St (DA/09) and Rhosmaen Street (2) (Carm/083) both reporting 40.1µg/m^3 (2018), and borderline between 36-38µg/m^3 in 2019 and No 133 (DA/10) which reported 41.3µg/m^3 in 2018, decreased to 34.8µg/m^3 in 2019, 24.3µg/m^3 for 2020, and has now reported 29.5µg/m^3 for 2021.

Figure 2.24 : Five Year Trend in Llandeilo AQMA (Highest NO_2 results)



2019 was the first year that has observed all monitoring locations in Llandeilo AQMA to fall below the Annual Air Quality Objective and has maintained this decrease furthermore into 2021.

The full trends over the last five years for Llanelli, Carmarthen and Llandeilo AQMA monitoring network are illustrated in Figure 2.17 – Trends in Annual Mean NO_2 Concentrations above. All of the diffusion monitoring sites are largely experiencing a downward trend, with the most significant improvement overwhelmingly observed in 2020.

2.3.1 Nitrogen Dioxide (NO_2)

Diffusion Tube Monitoring Data

Two sites in the diffusion tube network were corrected for NO_2 fall-off with distance because the post bias (and annualised) annual mean fell within 10% of the AQO. This site was Carmarthen - 85 Priory Street (E) (DAC/08) and nr 13 Felinfoel Road (DAL/07).

The calculation was carried out in accordance with paragraph 7.78 of LAQM Technical Guidance (16), using LAQM Helpdesk 'Diffusion Tube Processing Tool', which amalgamates the on-line LAQM Helpdesk distance calculator tool (Version 4.2) to generate the NO_2 predicted results for the fall-off with distance.

After using the Diffusion Tube processing tool to calculate the fall-off with distance for DAC/08 (85 Priory Street, Carmarthen) the result reduced from 38.8ug/m^3 to a predicted concentration of 36.8ug/m^3. This is a significant improvement in comparison to the 2019

result which exceeded the Annual Air Quality Objective at 44.3ug/m^3 after the fall off with distance was calculated.

After using the Diffusion Tube processing tool to calculate the fall-off with distance for nr 13 Felinfoel Road (DAL/07) the result reduced from 37.4ug/m^3 to a predicted concentration of 34.6ug/m^3. This is a small improvement in comparison to the 2019 result which exceeded the Annual Air Quality Objective at 38.1ug/m^3 after the fall off with distance was calculated.

Further details relating to the distance calculations are contained in Appendix C NO_2 Fall-off with Distance from the Road.

Overall, the total number of sites exceeding the AQO compared to 2019 has reduced from one to none; 85 Priory Street, Carmarthen (E) continues to have the highest reading of all monitoring sites in the County. This site has always been recognised as a hotspot within the Carmarthen AQMA. No sites demonstrated an exceedance of 60ug/m^3 or more which indicates there is unlikely to be any risk of exceeding the 1-hour objective.

There is one triplicate tube site which is in Llandeilo (DA/05 – Rhosmaen Street (Evans Butchers)) and this will be maintained for the continued monitoring and assessment of Action Plan work.

The tube sites associated with Burry Port and Ammanford all had results well below the AQO, as was expected, but the monitoring sites will be maintained for use as developments around the towns continue.

The monthly raw data results for the 2021 data, including the distance calculated prediction is contained in Table A1 Appendix A: Quality Assurance / Quality Control (QA/QC) Data.

2.3.2 Particulate Matter (PM_{10})

Carmarthenshire County Council does not monitor PM_{10}.

In previous years PM_{10} monitoring exercises have been carried out in various locations across the county where it has been considered there may be a potential issue or in response to complaints about industrial activities. None of the previous surveys have identified any breaches of the PM_{10} objective levels. Due to the continuing financial constraints, it was deemed appropriate to discontinue the annual surveys, unless a specific requirement was identified, and to concentrate on those air quality issues that

were known to exist, i.e. traffic related NO_2. There were no specific issues identified during 2021 that required a particulate monitoring survey to be performed.

2.3.3 Particulate Matter ($PM_{2.5}$)

Carmarthenshire County Council does not monitor $PM_{2.5}$, and there are currently no plans to do so in the future.

2.3.4 Other Pollutants Monitored

There has been no formal monitoring of sulphur dioxide by Carmarthenshire County Council. However, previous assessments and reports identified that there was the potential for exceedance of the 15-minute mean by way of idling steam locomotives at a station in Bronwydd, Carmarthen. The locomotives would regularly idle at the platform for periods of greater than 15 minutes where members of the public would be waiting, within 15 meters of the locomotives.

Discussions with the management of the railway company resulted in an agreed fixed work notice being issued that restricted the waiting time at the platform to less than 10 minutes. This agreement has been in place for many years and is still being monitored.

It has been agreed that Carmarthenshire County Council will carry out unannounced compliance visits to confirm that the requirements of the fixed work notice are being maintained. No issues were observed during 2021.

Carmarthenshire County Council does not carry out monitoring for benzene. There are no requirements for other pollutants to be monitored by Carmarthenshire County Council.

2.4 Summary of Compliance with AQS Objectives as of 2021

Carmarthenshire County Council has examined the results from monitoring in the County. Concentrations are all below the Objectives, therefore no further action is required. Some Concentrations in Carmarthen and Llanelli have been found to be close to the Objectives and therefore further investigation is required. Carmarthenshire County Council does not intend to revoke the Llandeilo, Llanelli or Carmarthen AQMA’s for lack of exceedance of Nitrogen Dioxide as further investigation is required before deciding on whether action is necessary. Therefore, these AQMAs should remain.

3 New Local Developments

There have been a number of planning applications received in the last couple of years for projects that span a number of years and a few more recent applications. Air Quality Assessments have been requested for some of the proposals to determine whether the developments will result in a negative impact on local air quality. Table 3.4 below summarises these details.

Table 3.1 - Planning Applications

Reference	Location	Information Request	Response	Status
PL/00839	Heol Aur, Dafen, Llanelli, SA14 8QN	Screening Assessment conducted to relocate existing Police custody suite outside AQMA. Include EV charging in carpark.	Negligible impact detailed AQA not required.	Granted
PL/00975	Park Owen, Station Road, St Clears, Carmarthenshire. SA33 4BP	Screening Assessment conducted for 45 residential untis and 97 parking spaces outside AQMA	Detailed AQA not required	Granted
PL/00842	Land at Station Road, Nantgaredig, Carmarthen, SA32 7LG	Screening Assessment conducted for 35 residential untst outside AQMA	Detailed AQA not required	Awaiting Decision
PL/00978	Land at St Clear's Roundabout, Old Tenby Road, St Clear's,	Air Quality Assessment submitted to support new access road from Tenby Road; erection	Dust management plan required	Granted

	Carmarthenshire. SA33 4JW	of a new petrol filling station with sales building; forecourt including fuelling provision for domestic and HGVs and underground fuel tanks; three jet washes and car care facilities; electric vehicle charging hub and supporting infrastructure; car parking and cycle parking		
PL/01026	Land at and adj. Former Dinas Yard, Pembrey Road, Kidwelly, Carmarthenshire. SA19 4TH	Screening AQ assessment for 82 residential dwellings incorporating sustainable design with approximately 203 car parking spaces	Dust assessment also submitted, dust management plan required	Reserved Matters Approval for 71 dwellings
S/40692	Housing Site Land north of Gors Fach, Cwm Y Nant, Dafen, Llanelli, Carmarthenshire, SA14 8NB	Screening assessment indicates no significant risk, outside AQMA	No detailed AQA required, dust management plan and electric charging requested	Outline Granted
PL/00878	Gateway Resort, Gateway Caravan Park, Bynea,	Screening assessment for 15-bed boutique hotel,	Dust mitigation required,	Full Granted

	Llanelli, Carmarthenshire. SA14 9SN	outside AQMA. No significant risk	Electric vehicle charging required 10% carparking spaces	
PL/02026	Unit 68, Stradey Park Business Centre, Mwrwg Road, Llangennech, SA14 8YO	88kW Biomass boiler, assessment indicated no significant impact	Information received to conduct biomass boiler assessment	Granted

3.1 Road Traffic Sources (and Other Transport)

During 2021, traffic related air pollution at different locations were considered in respect of an ongoing exercise in Ty Rhys in Carmarthen, Lower Trostre Road, Llanelli, Pantyblodau Road, Blaenau, Ammanford. An ongoing exercise at Afon Road to Bridge Street in Llangennech and in New Dock Road to Station Road in Llanelli, inclusion into the monitoring network at Pentip School in Llanelli, and a second-year study at Richmond Park Primary School Carmarthen. It was considered that each of these sites would benefit from monitoring of Nitrogen Dioxide during 2021. There was no breach of the AQS Objective at any of the screening locations assessed.

A further ongoing screening exercise, which started in May 2017 monitors NO_2 in existing routes surrounding the proposed Cross Hands Economic Link Road. Details of this first 2-year exercise was reported in the 2020 Annual Progress Report, assessing levels of NO_2 before and during construction however the final conclusions should be reported after the new link road has been built and opened, to observe the impact on levels of NO_2 on the surrounding routes (completion was originally planned for 2019 but has since been delayed until 2022).

An additional link road between Cross Hands Economic Link Road and Norton Road B4556, Carmarthenshire was granted planning permission in 2020. An Air Quality Assessment was conducted in 2013 for the main Economic Link Road and in terms of local air quality management and potential impacts on human health receptors, the main ELR proposed route would appear to create a positive benefit to several existing receptors located on the current road network in the vicinity of the development. The conclusion of the assessment for most of the monitored locations showed a reduction in nitrogen dioxide exposure, whilst for the small number of locations where the level of exposure increases, it is only by a small amount. The existing traffic levels in Norton Road are relatively low and recent monitoring of NO_2 indicates that the air quality for this area is significantly below the Air Quality Objective and outside of any Air Quality Management Area. It is not considered that the proposed development will have a significant adverse impact on air quality and the risk of dust to nearby receptors has been considered under a construction management plan.

Carmarthenshire Council has not identified any new road traffic sources since the last Assessment relating to:

- Narrow congested streets with residential properties close to the kerb.
- Busy streets where people may spend one hour or more close to traffic.
- Roads with a high flow of buses and/or HGVs.
- Junctions.
- New roads constructed or proposed since the last Assessment.
- Roads with significantly changed traffic flows.
- Bus or coach stations.
- Airports / diesel or steam trains / ports & Shipping
- Major roadworks / disruptions

3.2 Industrial / Fugitive or Uncontrolled Sources / Commercial Sources

3.2.1 Industrial Sources

3.2.1.1 New or Proposed Installations for which an Air Quality Assessment has been carried out

Carmarthenshire County Council has not identified any new developments with fugitive or uncontrolled sources since the last assessment relating to new or proposed installations for which an air quality assessment has been carried out.

3.2.1.2 Existing industrial Installations for where emissions have increased substantially, or new relevant exposure has been introduced

Carmarthenshire County Council has not identified any new developments with fugitive or uncontrolled sources since the last assessment relating to existing industrial installations where emissions have increased substantially, or new relevant exposure has been introduced.

3.2.1.3 New or significantly changed Industrial Installations with no previous air quality assessment

Torcoed Quarry are regulated under a Part B permit and have varied the fuel used on site for the Road stone coating plant under their Part B permit. The change involves using LPG gas as a main fuel with heating oil as a secondary fuel instead of only using processed fuel oil. The change includes using a cleaner fuel and should recue pollution emissions.

Carmarthenshire County Council has not identified any new developments with fugitive or uncontrolled sources since the last assessment relating to new or proposed installations for which an air quality assessment has been carried out.

3.2.1.4 Major Fuel Depots Storing Petrol

Carmarthenshire County Council has not identified any new developments with fugitive or uncontrolled sources since the last assessment relating to Major fuel storage depots storing petrol.

3.2.1.5 Petrol Stations

There have not been any new petrol stations with throughputs greater than 2000m^3 per annum near a busy road (>30,000 vehicle/day) where there is relevant exposure within 10m of the pumps.

Carmarthenshire County Council has granted planning permission for a new petrol station at Land at St Clear's Roundabout, Old Tenby Road, St Clear's, Carmarthenshire. SA33 4JW. Once constructed, it would require a art B permit for a Vapour Recovery Stage 1b and Stage II activities.

Carmarthenshire County Council has not identified any new developments with fugitive or uncontrolled sources since the last assessment relating to Petrol stations.

3.2.1.6 Poultry Farms

Carmarthenshire County Council has not identified any new developments with fugitive or uncontrolled sources since the last assessment relating to Poultry Farms.

3.2.2 Fugitive or Uncontrolled Sources

3.2.2.1 Landfill Sites

Carmarthenshire County Council confirms that there are no new or newly identified potential sources of fugitive or uncontrolled particulate matter, which include Landfill sites.

3.2.2.2 Quarries

Carmarthenshire County Council confirms that there are no new or newly identified potential sources of fugitive or uncontrolled particulate matter, which include Quarries.

3.2.2.3 Unmade Haulage Roads

Carmarthenshire County Council confirms that there are no new or newly identified potential sources of fugitive or uncontrolled particulate matter, which include unmade haulage roads on industrial sites.

3.2.2.4 Waste Transfer Stations

Carmarthenshire County Council confirms that there are no new or newly identified potential sources of fugitive or uncontrolled particulate matter, which include waste transfer sites.

3.2.2.5 Other potential sources of fugitive particulate emissions

Carmarthenshire County does not have any identified areas with a background PM_{10} >25µg/m^3. Potential receptors within the vicinity of dusty activities like construction or demolition are screened and where relevant, developers are requested to assess the impacts of dust from a construction or demolition proposal. Where an assessment is not required Developers are requested to follow good practice measures. In all cases a dust management plan or construction management plan is expected to support such

applications, to ensure that any adverse impacts identified by the development are mitigated to a negligible risk.

Carmarthenshire County Council confirms that there are no new or newly identified potential sources of fugitive or uncontrolled particulate matter, which include other potential sources of fugitive particulate matter emissions.

3.2.3 Commercial or Domestic Sources

3.2.3.1 Biomass Combustion Plant - Individual installations

It has been identified that several Biomass Boilers have been installed across the county, much of which has not been consulted on through the Planning Consultation process. Many are associated with agricultural use or commercial settings where the RHI incentive schemes have been a primary reason for installation. Much of the plant is located within the rural setting, although some do appear in the towns. It is not considered that many of these are likely to be having significant impact of local air quality, although relevant details of all the plant are not always obtained.

As part of Section 3.27 LAQM TG(16) it is a requirement to list any installations with the potential to impede on air quality with relevant exposure nearby.

A biomass boiler assessment was carried out in relation to the use of two boilers at Wood Mill, Llanddowrow. After a smoke complaint was received. The installation includes two boilers 200kW each and are compliant with the Renewable Heat Incentive (RHI) Scheme. Following LAQM TG(16) and using Defra's Screening Emissions Calculation tools for the calculation of actual and targeted emission rates, the need for further detailed assessments was evaluated. In this instance, the proposed facility indicated that actual emission rates were significantly below the targeted emission rates for PM_{10}, and NO2 and could be confidently screened out.

A biomass boiler assessment was carried out for an 80kw boiler at 68 Stradey Business Park, following submission of a planning application. Following LAQM TG(16) and using Defra's Screening Emissions Calculation tools for the calculation of actual and targeted emission rates, the need for further detailed assessments was evaluated. In this instance, the proposed facility indicated that actual emission rates were significantly below the targeted emission rates for PM_{10}, and NO2 and could be confidently screened out. The

capacity of the boiler and use of BSL approved fuel subject to quality control end of waste test meant that it was below the threshold of requiring an environmental permit.

3.2.3.2 Biomass Combustion Plant - Combined impact

One location near Llanelli has been identified as a small ‘concentration’ of biomass boilers where there exists a potential for local impact. Work carried out during 2017 has determined that no Environmental Permits are required, however this will be reviewed should circumstances change. A company at Stradey Business Park, Llangennech, have made enquiries to apply for a permit to burn waste ‘pallet’ wood in four of their biomass boilers. The combined impact will be assessed as part of the application.

Carmarthenshire County Council has not identified any other commercial or domestic sources in relation to areas where the combined impact of several biomass combustion sources may be relevant.

3.2.3.3 Other Sources

Carmarthenshire County Council has not identified any other commercial or domestic sources in relation:

- Areas where domestic solid fuel burning may be relevant.
- Combined Heat and Power (CHP) plant.

3.3 Other Sources

Carmarthenshire County Council have not identified any bonfires or domestic wood burns that could contribute to air pollution.

Carmarthenshire 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.

Carmarthenshire 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 Local / Regional Air Quality Strategy

Carmarthenshire County Council has not developed a specific Local Air Quality Strategy. The air quality work is based on the National Strategies for monitoring of air quality and this has been used as the county's Air Quality Plan. The air quality work is constantly being reviewed to ensure it remains relevant and appropriate. The designation of the AQMA's in Llandeilo, Llanelli and Carmarthen and the setting up of the Steering and Action Planning Groups has helped to forge the links with internal stakeholders.

Having more internal links has helped to raise the profile of the air quality work such that there is greater collaboration between departments leading to improved communications and working arrangements.

A regional document was developed between Carmarthenshire, Ceredigion, Powys and Pembrokeshire in 2011/12 which was aimed at developers and planners to provide guidance from the air quality perspective on new development. The document was very much based on the Environmental Protection UK guidance document "Development Control: Planning for Air Quality (2010 Update)". The collaborative guidance document was written and agreed between the four authorities and issued in September 2012. It was made available to the Planning Departments of each authority and was used to assist with planning consultations. The document is titled "Mid and West Wales, Air Quality: A Guide for Developers".

Since the review of the EPUK 2010 document (which was issued in May 2015 and more recently January 2017) it has been agreed between the four authorities that the 2017 document would form the basis of the Regional Strategy. As part of Action Planning work we are looking at developing local strategies that can be applied to development with the ultimate aim of minimising air quality impacts from development wherever possible.

In carrying out our functions under Part IV of the 1995 Act, due regard is given to the policy guidance issued by Welsh government 'Local Air Quality Management in Wales' and the five ways of working as set out by the Well-being and Future Generations (Wales) Act 2015 are adopted when conducting out our functions to manage local air quality.

4.2 Air Quality Planning Policies

Carmarthenshire County Council is in the process of preparing the Revised Local Development Plan (LDP) for its area (excluding that part contained within the Brecon Beacons National Park). Once finalised (adopted), the Revised LDP will supersede the current adopted LDP with decisions on planning permissions primarily based on its content. The current Carmarthenshire Local Development Plan (LDP) was adopted by the County Council on 10th December 2014.

Whilst development proposals should be considered against the policies and provisions of the Plan as a whole (along with other relevant considerations and policies), the most notable LDP policy in relation to Air Quality is EP2: Pollution and TR2: Location of Development – Transport Considerations which are set out below:

Policy EP2 Pollution

Proposals for development should wherever possible seek to minimise the impacts of pollution. New developments will be required to demonstrate that they:

a) *Do not conflict with National Air Quality Strategy objectives, or adversely affect to a significant extent, designated Air Quality Management Areas (permitted developments may be conditioned to abide by best practice);*
b) *Do not cause a deterioration in water quality;*
c) *Ensure that light and noise pollution are where appropriate minimised;*
d) *Ensure that risks arising from contaminated land are addressed through an appropriate land investigation and assessment of risk and land remediation to ensure its suitability for the proposed use.*

Strategic Objectives Supported: SO4, SO5, SO10 and SO11
This policy should be read in conjunction with other relevant policies and proposals of this LDP.

Policy TR2: Location of Development- Transport Considerations

Proposals which have a potential for significant trip generation will be permitted where:

a. *It is located in a manner consistent with the plans strategic objectives, its settlement framework and its policies and proposals;*
b. *It is accessible to non-car modes of transport including public transport, cycling and walking;*
c. *Provision is made for the non-car modes of transport and for those with mobility difficulties in the design of the proposal and the provision of on site facilities;*
d. *Travel Plans have been considered and where appropriate incorporated.*

Strategic Objectives Supported: SO1, SO2, SO3, SO4, SO5, SO6, SO8, SO9, SO10, SO11, SO12, SO13 and SO14
This policy should be read in conjunction with other relevant policies and proposals of this LDP.

The Air Quality Management Orders for Carmarthen and Llanelli have been signed and Action Plans have been developed. As part of the Action Plan work discussions are ongoing in respect of what opportunities there are to update the supporting text to Policy EP2 (paragraph 6.8.21) and embrace the latest Welsh Government Policy on Air Quality.

It should be noted that clear guidance in respect of a range of Environmental Protection matters are contained within Planning Policy Wales (PPW), notably in relation to the impact of development on Air Quality Management Areas; minimising pollution of air and water. These are not therefore repeated within the LDP. Additional national development management policy statements may be found in PPW.

4.3 Local Transport Plans and Strategies

The authority historically held a Local Transport Plan; however, this was incorporated into a Regional Transport Plan which had been established under the direction of the Welsh Government. The region covers the unitary authorities of Neath-Port Talbot, Swansea, Carmarthenshire and Pembrokeshire. The collective name of the authorities was known as the South West Wales Integrated Transport Consortium (SWWITCH).

The Regional Transport Plan, as issued by SWWITCH is now no longer being utilised in the same way since funding for the consortium was removed. It is now expected that local

transport plans will be developed but that will still have to have due regard to the regional transport requirements.

However, the partnership arrangement with the other authorities remains in place and they have developed a combined Local Transport Plan for the Swansea Bay City Region covering the period 2015 – 2020.

The Local Air Quality Management work that fed into the Regional Transport Plan work has now transferred and is given due regard within the Local Transport Plan and the policy and infrastructure interventions being tailored to help improve air quality and minimise air pollution from transport sources.

Further information on the Local Transport Plan can be found using the link below: https://www.swansea.gov.uk/localtransportplan

Reference is also made to this in Carmarthenshire's Parking Strategy 2018, which can be found at: http://democratiaeth.sirgar.llyw.cymru/documents/s20624/Adroddiad.pdf?LLL=1

4.4 Active Travel Plans and Strategies

It is acknowledged that NO_2 from road traffic is the primary cause for concern for Carmarthenshire. Any measures that can encourage and facilitate alternative means of transport are therefore to be welcomed. The Active Travel (Wales) Act 2013 places a statutory requirement on Local Authorities to identify and improve routes for walking and cycling, which includes the publication of maps to identify suitable routes, and to provide links within key locations, such as places of work, education etc

Carmarthenshire County Council has published its integrated network maps, which can be found here: https://www.carmarthenshire.gov.wales/home/council-services/travel-roads-parking/active-travel/#.W832x-aot9B

This ties in with the Council's long term aim of becoming the Cycling Hub of Wales. Further information on Carmarthenshire's cycling strategy can be found here: https://www.carmarthenshire.gov.wales/home/business/tourism/tourism-priorities/cycling/#.W834XOaot9B

4.5 Local Authorities Well-being Objectives

Following work undertaken to formulate Carmarthenshire's Well-being Assessment, the Public Services Board produced Carmarthenshire's Well-being plan for 2018-2023. This is very much based on the 7 well-being goals and five ways of working (Wellbeing of Future Generations (Wales) Act 2015).

Carmarthenshire's Corporate Strategy 2018-2023 sets out its Well-being objectives which seeks to continuously improve economic, environmental, social and cultural well-being in the County. This was updated in June 2019 following a consultation in January 2019.

Carmarthenshire's Corporate Strategy 2018-2023 includes its Well-being Objectives for the period. Air Quality can impact on a few the 15 objectives that have been identified, however, Well-being Objective 8 "Live well – Help People Live Healthy Lives", contains a range of actions, one of which specifically relates to the monitoring of Air Quality (nitrogen dioxide).

We track progress on this action through quarterly Performance Monitoring reports.

4.6 Green Infrastructure Plans and Strategies

A green infrastructure assessment has been undertaken, in which all green infrastructure assets across the County have been mapped. This will help identify areas where tree planting schemes could be implemented and quantify in area (for monitoring and reporting purposes) green infrastructure across the County.
Further work is also in progress to develop a Green and Blue Infrastructure Strategy, with a consultation conducted at end of 2021. Thi will build on evidence on the cost-effectiveness and benefits of using nature-based solutions to tackle and solve a range of economic, social, environmental and well-being problems.

The Council adopted a supplementary planning guidance in September 2016, 'Placemaking and Design' which encourages developers to adopt a green infrastructure approach to support policy GP1 of the Local Development Plan for 'Sustainability and High-Quality Design'.

The Council's Corporate Strategy 2018-23 also has a Well-being objective to '*Look after the Environment now and in the future*', which reflects the Resilience Goal in the Well-being Future Generations Act that requires public bodies to set objectives to achieve a 'biodiverse natural environment with healthy functioning ecosystems'.

A Forward Plan for Environment (Wales) Act 2016 to protect habitats and biodiversity was revised by Carmarthenshire County Council in February 2019 and its associated actions include action 7bTH: *'Highways and Transportation will work with Rural Conservation section to identify and highlight opportunities in the development and implementation of new infrastructure that positively contributes to ecological resilience.*'

A Pollinator Strategy for Carmarthenshire was recently published in August 2020 to inform positive action for pollinators throughout the council's work. Carmarthenshire Nature Partnership are working to produce a Local Nature Recovery Plan to address the address the issues that are driving the decline in biodiversity, and to support recovery.

These works support the strategic objectives set out in 'Wales Nature Recovery Action Plan' produced by Wales Biodiversity Partnership, the Carmarthenshire Public Service Board Well-being Plan and the Council's Well-being objectives and The Well-being of Future Generations (Wales) Act 2015.

4.7 Climate Change Strategies

There are several measures contained within Carmarthenshire's Corporate Strategy 2018-2023 that relate to Climate Change, specifically around the implementation and promotion of the increased use of renewable energy. In February 2019 Carmarthenshire County Council adopted a zero-carbon motion to become carbon neutral by 2030 in support of well-being objective 12 'Improve the Environment for now and the future'. We have since been the first local authority in Wales to publish a net zero carbon action plan, which was endorsed by full Council in February 2020, which outlines our route towards becoming a Net Zero Carbon Local Authority by 2030.

5 Conclusion and Proposed Actions

5.1 Conclusions from New Monitoring Data

There have been no exceedances of the Annual Air Quality Objective (AQO) for NO_2 during 2021 or 2020, compared to one site identified in 2019 and located within Carmarthen's AQMA.

Two sites reported a borderline compliant result, within 10% of the Air Quality Objective, they included nr 13 Felinfoel Road (DAL/07) and 85 Priory Street (DAC/08). 85 Priory Street was also the only site that reported borderline compliance of the AQO in 2020. This site continues to produce the highest readings in the County, yet this is the second year running that it has not exceeded the AQO.

Both nr 13 Felinfoel Road (DAL/07) and 85 Priory Street (DAC/08) was adjusted further because the monitoring site is not located on the façade of the nearest receptor. The predicted annual concentration was 34.6µg/m^3 for DAL/07, whereas DAC/08 remained borderline compliant with a predicted 36.8µg/m^3, after calculating the NO_2 fall-off with distance. This is similar to 2020 (35.3µg/m^3) but much lower than the previous three years which reported predicted exposure at 44.3µg/m^3 (2019), 48.5µg/m3 (2018) and 53.6µg/m3 (2017).

No sites in the Llanelli AQMA exceeded the AQO for 2019 or 2020, compared to one exceedance reported for 2018. This was at nr 13 Felinfoel Road (DAL/07), and although it appeared to exceed the AQO for 2019, after calculating the NO2 fall off distance, the levels were reduced from 41.2µg/m^3 to 38.1.1µg/m^3. Last year (2020) no calculation was necessary as the annual average had fallen to 31.6µg/m^3. It is good to report that this site has fallen below the Annual AQO for the third time in eight years, as it tends to provide the highest readings in Llanelli AQMA.

Five further sites across the County reported an annual result above 30µg/m^3 two of which were located in Llanelli including; Carm/077 Sandy Road(2) and Thomas Street(Barnados) (DAL/09). One site was located within the Carmarthen AQMA 15 Park Terrace (DAC/02) and two sites were located in Llandeilo, including Llandeilo Rhosmaen Street

(2)(Carm/083) and Rhosmaen Street (No.123)(DA/09), both of which exceeded the AQO in 2018.

15 Park Terrace (DAC/02) remained on the border of meeting the AQO in 2019 at 37.6µg/m^3 which was a small increase from 2018 which reported 36µg/m^3 , so although it complied for 2020 with 29.6µg/m^3, 2021 has also observed a significant improvement from the previous years with 31.9µg/m^3, it's important that we continue to investigate this to ensure the level continue to fall.

Carm/077 Sandy Road(2) appeared to be borderline of AQO in 2019, however after calculating the NO_2 fall off distance the levels were reduced from 38.9µg/m^3 to 29.6µg/m^3, because the monitoring site is located some distance from the nearest receptor and near to the road. For 2021 and 2020 results, no distance calculation was necessary as it did not report a borderline result, however the predicted result would likely reflect 44 Sandy Road (DAL22) at 27.6µg/m^3 because this site reflects the nearest receptor.

Thomas Street (Barnados) (DAL/09) reported 34.4µg/m^3 for 2021, 31.5µg/m^3 for 2020, and was borderline compliant in 2019 with a concentration of 37.6µg/m^3 , and so for the fourth-year running has not exceeded the AQO.

Llandeilo AQMA also reported no exceedances of the annual AQO and for the third year running since the AQMA was declared. Although it did not report any annual results greater than 30µg/m^3 within its AQMA for 2020, two have for 2021 and a third site; 133 Rhosmaen St (DA/10) is close with 29.9µg/m^3.
The two sites in Llandeilo that breached the AQO during 2018, included sites 123 Rhosmaen St (DA/09) which last year (2019) reported 38.6µg/m^3 after exceeding the AQO for the previous six years, and 133 Rhosmaen St (DA/10) which exceeded the AQO in 2018 with 41.3µg/m^3, however observed a significant reduction for 2019 with 34.8µg/m^3, and an even greater drop to 24.3µg/m^3 for 2020.

In 2019 Rhosmaen Street (2) (Carm/083) appeared to be within 10% of compliance with 36.8 µg/m^3 (2019) but finally reported 33.1µg/m^3 after calculating the NO_2 fall-off with distance, however this reduced to 27.4µg/m^3 for 2020 and 31.7µg/m^3 for 2021, and so no further calculation is necessary for the last two years.

All other areas of the county where diffusion tube monitoring is performed have not identified any other areas of exceedance. However, many sites that remain marginally compliant will require further monitoring and work to ensure that levels of NO_2 do not exceed the AQO in the future and as future development is planned, typical travel behaviours resume and in case adverse weather conditions do not influence the results favourably.

5.2 Conclusions relating to New Local Developments

Work continues with a number of new development sites across the county that have been previously reported, but as yet no impacts on air quality have been identified.

The Carmarthen Western Link road was been completed and opened to the public in May 2019, congestion appears to have improved but continued monitoring of NO_2 will determine if this bypass has had a positive impact and has not moved the problem to another part of Town. This will be reported in 2023.

Phase 2 of the Cross Hands Economic Link Road (ELR)development is still under construction, Phase 2 will link Black Lion Road to the A476 north of Gorslas (before the junction with the B4297 Gate Road). The first link of Phase 2 from A476 to Norton Road and work is continuing on constructing the second link from Norton Road to the Black Lion Road along with a further link road from Norton Road to the ELR, which should help direct haulage vehicles onto the ELR away from some residential properties. Once complete, the road will open access to the Cross Hands East Strategic employment site benefitting existing infrastructure whilst improving traffic flows and journey time. It is also aimed to relieve congestion and improve safety at the A48 Cross Hands Roundabout, A476 Llandeilo Road and A476 Gorslas ‘six-ways’ junctions supporting the ‘Safe Routes in Communities Programme and improve air quality on existing residential routes.

5.3 Other Conclusions

A significant amount of work has been carried out to create, improve and promote sustainable travel options for residents and visitors in the County, whether through grant funding or through the development process. However, it is difficult to determine that any single intervention alone has made a positive impact on reducing nitrogen dioxide levels within our County. The collaborative partnership approach taken by different services is

key to delivering any impacts, and it's recognised that any small gains are collectively beneficial to improving local air quality.

The COVID19 Pandemic has provided an overdue boost towards supporting people to undertake activities without needing to travel by car. From home and agile working opportunities, to accessing services digitally and meeting virtually, one no longer needs to consider using the car in the first instance. Carmarthenshire County Council has used this as an opportunity to engage better with residents and businesses to help develop the active travel network and infrastructure to support this change in travel behaviour further and help it continue beyond the pandemic.

Whilst no 'formal' Air Quality Strategy exists, the use of the Environmental Protection UK Guidance document has increased and has been an agreed update to the regional strategy that had been developed.

Although the Regional Transport Plan no longer exists, as such, many of the elements that were within the plan have been incorporated into the Joint Transport Plan for South West Wales which incorporates the Local Transport Plan (LTP). This has been developed in collaboration with the other local authorities across the region. The Plan recognises the potential impacts from transport sources and is reviewed as more data and information relating to air quality across the region becomes available.

Carmarthenshire's Cycling Strategy holds the vision of being the Cycling Hub of Wales. Work continues to progress with improvements to market more cycling in Carmarthenshire with the re-development of the Carmarthen Velodrome and the Pembrey Closed Circuit track now complete and proving popular. Further work to improve footpaths and map cycle routes is also underway. The Tywi Valley cycle path also continues to progress.

The Local Development Plan (LDP) has been adopted and updated with specific reference to air quality and the need to consider air quality impacts from development. The LDP also references national guidance and policy relating to air quality that has been incorporated into Welsh Planning Policies. Discussions are taking place to update the Plan to incorporate latest policy guidance and ensure air quality impacts are minimised.

Phase 2 of the Cross Hands Economic Link Road is currently under review due to the proximity to a SSSI site and the potential vehicle emission impact is being assessed. Although not strictly within the LAQM remit, in the interests of a holistic approach and

taking in to account the WG Future Generations Act it is deemed prudent to report the findings of the work. Monitoring of NO_2 in the area is continuing.

5.4 Proposed Actions

There has been no requirement to undertake further assessment / investigation for any pollutant identified during the year, nor is there a need to declare any new AQMAs. There is also no need to change the boundaries of the AQMA's as we have observed a continued improvement in 2021 compared to pre-2020. No additional routes or areas have been identified as sites as a potential concern.

Although we have observed a general increase in NO2 levels compared to 2020, it's an improvement compared to previous years and for the second year running we have not observed any exceedances of the AQO, Nevertheless, it is too premature to consider revoking the AQMA's at this stage. Llanelli and Carmarthen have reported no exceedances for the last two years, and Llandeilo has had no exceedances for the last three years, still there have been borderline results reported. It's important to ensure that the reduction trend continues and is not just reflective of an unprecedented year for travel behavioural change. Furthermore, the influence of the weather needs to be considered to ensure that the reductions continue despite a change in weather conditions.

The diffusion tube monitoring in Llandeilo will continue and further work will be carried out to progress the Llandeilo and Ffairfach transport study commissioned by Welsh Government, in consultation with the Public, to improve the highway network and air quality in the Llandeilo AQMA. The Llandeilo AQAP will also be reviewed during 2023 to include the progress of the options included within this study and identify any further work necessary to improve air quality in this area. This review has been postponed from 2020 to 2022, resulting from delays caused by the COVID-19 Pandemic as we want to ensure that any further reviews does not hinder but complements the work already in progress under the Llandeilo and Transport Study, especially as air quality is a key objective to this work.

The diffusion tube monitoring in the towns of Llanelli and Carmarthen will continue along with progress to address the Action Plans with relevant partners. Much has changed since we first consulted on our action plans and following the Pandemic. As such we will progress on work identified under our Air Quality Delivery Plan which both encompasses

the outstanding actions from our adopted AQAP's for Carmarthen, Llanelli and Llandeilo, alongside the additional measures in line with other key Council priorities to improve air quality across the County as a whole. Actions would normally be prioritised on improving the transport network to reduce congestion. However, actions to help encourage active travel and choose sustainable modes of transport have also been identified with particular importance during the post COVID-19 Pandemic, to encourage a behavioural modal shift. This is especially evident from the improvements observed from reduced travel during 2020.

The Authority, working in partnership with other Public Services has set up a Public Service Board and is working collaboratively with Pembrokeshire and Ceredigion to assess and develop Well-being Plans (WBP) which will work towards the seven Well-Being goals identified in the Well-being of Future Generations (Wales) Act 2015. The LAQM work will be reported and hopefully help raise the profile of health impacts from air quality.

Monitoring of Nitrogen dioxide at Laugharne, has been set up for 2022, following reports of increased travel particularly during the summer periods. The area observed an increase of visitors during the pandemic when 'stay at home holidays' were encouraged and there has also been development to increase the local campsites. The area does not experience high traffic counts although a number of HGVs and tractors use the main route that travels through the town. The landscape of which is vary narrow in parts with lengths of terraced buildings, we would expect to report on any findings in our Progress Report of 2023.

The Authority will continue to check compliance with the steam engine idling times at Gwili Railway station in Bronwydd by way of unannounced visits.

Work will start towards completing aspects for the 2023 Progress Report and the Authority will engage with Welsh Government and the LAQM support helpdesk to deliver improvements to air quality.

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Appendices

Appendix A: Monthly Diffusion Tube Monitoring Results

Appendix B: A Summary of Local Air Quality Management

Appendix C: Air Quality Monitoring Data QA/QC

Appendix D: AQMA Boundary Maps

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

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

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.78) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
AMMANFORD															
Carm/089	24.6	23.7	13.6	24.7	18.4	15.3	15.0	9.2	20.9	21.8	32.6	26.0	20.5	15.8	
Carm/064		27.6	22.7	27.5	22.8	21.1	19.5	18.7	31.2	27.1	34.9	32.0	25.9	20.0	
Carm/090	33.9	28.2	30.3	31.2	27.4	20.5	22.5	18.8	29.3	28.9	37.7	29.2	28.2	21.7	
LLANELLI															
DAL/14	19.9	20.7		25.2		14.6	22.3	16.8	28.1	27.8	32.9	32.9	24.1	18.6	-
DAL/15	23.9	20.1	20.2	29.0	17.7		19.3	15.4	24.6	23.9		25.6	22.0	16.9	-
Carm/077		39.2	42.6	47.0	41.5	33.3	40.5	35.0	50.2	46.0	50.6	44.7	**42.8**	32.9	-
DAL/22	37.4	33.1	34.7	36.8	36.2		33.8	27.6	41.1	35.6	39.9	37.9	35.8	27.6	-
DAL/26	27.2	21.6	21.5	30.2	19.6	16.9	19.3	17.7	24.9	19.9	32.9	15.7	22.3	17.2	-
DAL/27	33.1	26.0			18.7	23.3	20.5	19.6	30.7	25.5	36.6	31.9	26.6	20.5	-
DAL/16		21.9	19.2	23.3	18.0	15.3	17.0	14.3	23.8	20.2	24.9	21.9	20.0	15.4	-
DAL/17	25.1	20.0	22.5	31.0	19.0	19.8	19.3	18.6	24.6	22.3	32.0	27.1	23.4	18.1	-
Carm/141	27.8	27.5		26.0	26.8	21.3	25.7	19.9	31.9	31.2	35.0	32.0	27.7	21.4	-
DAL/07	49.9	39.8		54.1	50.0	43.2	50.7	44.0	57.2	45.8		50.9	**48.6**	37.4	34.6
DAL/23	24.8	28.8	19.6	22.4	21.5	17.2	19.2	19.6	26.3	22.3	24.2	24.5	22.5	17.4	-
DAL/09	37.6	40.2	47.6	41.4	44.7	38.0	45.6	40.7	49.7	50.9	54.9	45.5	**44.7**	34.4	-
Carm/104	39.5	37.4	34.4		33.6	33.6	35.9	30.6	44.0	35.6	43.5	38.5	37.0	28.5	-
DAL/10	36.6	33.9	32.9	37.1	26.9	31.6	27.7	22.6	37.0	37.8		38.9	33.0	25.4	-
Carm/069	44.8	36.0	33.4	37.9	35.2	31.2	31.9	30.8	43.2	35.4	40.4		36.4	28.0	-
DAL/12	33.9	31.3	26.7	30.3	24.0	17.4	24.3	19.4	35.1	31.2	38.1	35.9	29.0	22.3	-

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.78) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
DAL/28	30.8	27.2	22.4	24.5	18.8	16.1	18.3		26.1	19.9	29.5	29.1	23.9	18.4	-
DAL/04	36.2	29.5	28.4	32.2		23.1	21.0	25.6					28.0	21.2	-
Carm/114	39.8	34.1	35.7	34.4		27.9	23.3	27.1	35.1	33.4		34.1	32.5	25.0	-
Carm/113	31.7	29.4	31.8	34.8		32.6	17.2	28.2	39.8	32.9	34.7	33.4	31.5	24.3	-
Carm/135	30.1	23.5	24.7	26.7	27.2	21.8	22.4	20.0	30.4	33.8	34.5	32.1	27.3	21.0	-
TYL1	27.6	24.1	22.9	23.3	19.2	15.7	20.6	17.4	20.8	22.9	33.0	27.2	22.9	17.6	-
TYL2	22.2	22.3	18.6			13.6	15.8	13.9					17.7	14.0	-
TYL3	25.9								18.1	19.8	26.1	24.9	23.0	16.0	-
TYL4	27.9	22.7	19.9	23.7		12.5	16.0	13.4	16.8	19.7	26.7	24.8	20.4	15.7	-
Carm/144	14.3	16.4			9.4	7.1	9.2	8.8	10.6	14.0	17.7	18.4	12.6	9.7	-
Carm/145	21.4	19.0	12.1	13.5	9.9	8.6	9.4	8.7	11.4	15.6	21.8	22.8	14.5	11.2	-
CARMARTHEN															
DAC/06	26.8		26.0	30.8	27.1	22.3	24.5	22.4	33.2	33.2	38.5		28.5	21.9	-
DAC/13	38.5	27.1	29.1	31.3	29.2	24.8	26.3	25.9	37.6	37.5			30.7	23.7	-
Carm/109	38.2	33.9	30.5	35.1	32.1	28.7	28.2	28.8	45.8	38.7	45.7		35.1	27.0	-
DAC/08	55.2	40.9	50.0	54.9	47.2	37.6	49.3	46.2	65.2	58.0			**50.5**	38.8	36.8
DAC/14	35.0	31.7	30.0	28.1	26.6	24.6	23.5	28.9	35.1	36.4	40.3		30.9	23.8	-
DAC/15	23.4	26.9	26.5	23.0	26.0	17.1	22.0	22.4	29.2	31.6	34.0		25.6	19.7	-
Carm/111	37.2	32.1	28.2	26.6	21.1	23.2	20.8	14.1	33.4	32.1	28.5		27.0	20.8	-
DAC/12		26.0	28.5	28.8	24.2	21.8	26.0	24.5	34.8	44.4	45.1		30.4	23.4	-
DAC/04	23.0		20.8	21.6	15.1				21.9	23.6	30.6		22.4	16.0	-
Carm/072	28.7	30.5	33.2	29.5	27.7	21.8	22.8	27.1	32.7	39.7		35.2	29.9	23.0	-
DAC/02	27.3	41.1	42.4	37.2	44.0	36.0	38.3	37.4	51.4	45.3	50.0	46.8	**41.4**	31.9	-
DAC/16	36.0	41.8	35.9	37.9	25.4	31.8	31.8	35.4	45.4	39.3		44.7	36.9	28.4	-
Carm/001	36.1	30.6	28.8	31.5	15.1	20.9	23.2	25.5	32.3	31.9	43.1	37.1	29.7	22.8	-
Carm/084	40.1	32.3	33.0	37.1	28.6	27.0	26.8	31.0		33.1	45.4	43.4	34.3	26.4	-

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.78) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
DAC/05	38.4	32.6		32.4		27.7	27.2	25.2	38.9		43.0	42.1	34.2	26.3	
Carm/106	40.4	26.3	28.3	33.5	31.5	24.1	29.4	26.4	38.9	37.9		37.5	32.2	24.8	
Carm/134	17.4	14.4	11.1	11.4	9.3	7.7	8.0	7.3	13.1	12.6	19.1	17.1	12.4	9.5	
Carm/126	27.8	22.5	21.6	19.1	20.0	15.4	18.3	16.0	26.2	23.8	31.7	25.6	22.3	17.2	
Carm/132	22.2	18.3	15.7	20.8	14.6		14.5	12.0	20.4	18.4	23.9	21.4	18.4	14.2	
Carm/133	17.2	12.8	12.4	17.4	10.7	10.4	11.1	9.1	16.2	12.4	19.3	15.2	13.7	10.5	
Carm/142	23.5	16.9	15.6			10.7	15.1	11.0	20.4	18.0	23.8	15.6	17.1	13.1	
Carm/112a	33.6	25.8	25.0	23.3	23.5	18.9	20.3	17.1	29.8	32.9	37.7	31.0	26.6	20.5	
Carm/143	24.7		13.5	14.5	12.5	9.5	9.1	10.3	16.9	18.1			14.3	11.0	
LLANDEILO															
FA/01	17.3	7.7	11.0	13.2	11.3	13.2	13.3	11.0	13.9	13.8	20.9	17.1	13.6	10.5	
DA/15	18.2	24.8	20.6	22.6	11.7	17.1	20.6	20.1	24.8	27.0		25.2	21.2	16.3	
DA/01	26.5	20.6	20.3	22.6	13.5	19.2	19.7	17.9	23.1	23.3	29.4	23.4	21.6	16.7	
DA/03	22.5	25.5	22.7	22.2	17.4	20.1	19.2	22.0	20.3	27.3	30.3	22.1	22.6	17.4	
Carm/013	33.2	27.6	31.0	29.2	30.9	26.6	22.6	27.9	32.7	32.1		20.1	28.5	22.0	
DA/05 (A), (B) & (C)	36.8	36.0	26.3	36.5	29.8	33.9	31.7	28.9	38.1	37.4	43.4	35.5	34.5	26.6	
DA/07	28.6	35.7	33.0	41.4	35.2	35.8	37.6	33.7	43.5	38.6	42.5	33.7	36.6	28.2	
Carm/083	40.1	33.3	36.9	47.4	32.6	41.8	41.2	37.6	47.9	41.1	53.9	39.5	**41.1**	31.7	
DA/09	42.5	40.0	33.9	49.8	37.2	39.0	29.8	41.5	45.7	42.4	58.2	41.3	**41.8**	32.2	
DA/10	41.1	33.2	35.4	43.0	35.3	37.0	34.4	28.9	43.8	40.2	48.5		38.3	29.5	
DA/11	33.3	31.8	33.8	36.8	34.4	33.9	31.7	33.1	36.9	41.1	48.5	44.9	36.7	28.2	
DA/12		20.4		16.2	11.5	14.4	16.7	16.1	17.5	26.1	26.6	24.5	19.0	14.6	
DA/13	28.0	29.4	28.6	33.5	22.8	31.1	31.2	31.5	32.7	35.7	41.7	31.3	31.5	24.2	
DA/14	28.6	24.8	21.2	23.4	23.9	19.4	23.8	19.8	26.7	28.0	32.9	23.9	24.7	19.0	
DA/16	32.4	25.7	30.2	29.5	30.4	28.9	30.8	27.1	33.0	32.4	41.4	30.3	31.0	23.9	
BURRY PORT															
Carm/127	18.5	12.0	12.2	12.6	7.9	7.7	9.4	9.2	13.2	11.4	17.0	16.6	12.3	9.5	

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.78) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
Carm/128	18.5	19.9	14.9	16.4	10.2	11.5	13.4	11.3	17.9	14.1	20.0	19.5	15.6	12.0	
LLANGENNECH															
LLG2	26.4	26.7	17.0	20.4	17.8	14.4	14.4	15.1	18.4	21.0		25.9	19.8	15.2	
LLG3	22.5	22.1	19.0	20.6	12.6	13.5	11.2	12.8	16.4	18.5	24.4	22.6	18.0	13.9	
CROSS HANDS / ECONOMIC LINK ROAD															
Carm/ELR1	28.4	31.6	30.3	32.0	30.0	30.9	31.8	32.9	22.9	40.5	42.4		32.2	24.8	
Carm/ELR2	18.8	21.5			18.7	20.3	20.0	20.1		26.2	25.5	24.3	21.7	16.7	
Carm/ELR3	23.3	20.3		16.9		14.6	14.6	13.4	20.4		24.5		18.5	14.1	
Carm/ELR4	16.6	15.5	14.7	14.9	12.9	9.5	11.4	10.5	14.0	15.7	20.5	19.1	14.6	11.2	
Carm/ELR9	10.3	9.5	8.9	7.3	3.7	4.4	5.2	4.2	7.8	7.6	9.0	9.9	7.3	5.6	
Carm/ELR10		15.6											-	-	
Carm/ELR11	16.5	12.1			2.6	6.7	7.1	7.7	11.3	13.2	13.8	12.9	10.4	8.0	
Carm/ELR12	17.5	15.2		10.2	10.4	7.2	7.6	9.5	12.9	15.8	17.7	16.9	12.8	9.9	
Carm/ELR21	14.8	12.4	12.2	10.1	10.7	8.0	7.5	8.0	12.1	12.5	14.9		11.2	8.6	
Carm/ELR22	19.7	18.3	18.4	18.0	13.2		12.4	10.9	17.0	18.5		18.3	16.5	12.7	
RICHMOND PARK SCHOOL															
RPS/1	18.7	12.5	11.1	10.7	7.7	7.5	7.9	8.4	12.5	13.0	17.2	11.8	11.6	8.9	
RPS/2	16.3	11.5	9.3	8.0		6.3		8.0		11.4	13.8	12.9	10.8	8.3	
RPS/3	12.5	13.8	10.8	9.1	7.8	6.9	6.8	8.0	11.6	12.3	16.6	13.5	10.8	8.3	
RPS/4	17.1	12.6	8.9	8.9	7.5	6.5	7.1	7.4	10.4	11.3	15.3	14.9	10.7	8.2	
RPS/5	19.6	14.9	12.0	10.8	7.4	6.3	8.2	8.6	13.1	12.8	18.7	15.1	12.3	9.5	
RPS/6	17.0	12.9	10.2	9.4		6.8	7.2		10.8	11.5	15.6	12.1	11.4	8.7	
RPS/7	19.0	15.7	12.1	10.3	6.7	8.0	7.6	9.5	12.6	12.1	16.5		11.8	9.1	
RPS/8	18.9	14.3	11.9	10.2		6.9	7.0	8.5	10.7	12.0	19.0	15.3	12.2	9.4	
FFAIRFACH															
FA/04(A)		12.6	10.9	12.1	11.5	10.0	10.3	9.8	13.7	16.4		8.6	11.6	8.9	
FA/06(A)		13.7	13.5	15.8	11.7	11.4	15.1	12.3	13.4	13.9		15.3	13.6	10.5	
FA/03(A)		18.1	15.3	20.9	12.8	15.3	18.5	16.2	20.7	19.5	25.6	20.1	18.5	14.2	
FA/07(A)		8.3	7.8	8.3	5.1	7.4	6.6	6.7	6.1	8.5		9.9	7.5	5.8	

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.78) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
NEW SCREENING SITES															
ELR/10(B)				13.3	8.0	8.4	8.9	7.2	12.7	15.0	18.8	14.5	11.9	9.1	
PBB1			7.6	8.4	3.4	5.1	7.9	5.7					6.4	5.7	
TYL5			17.4	18.2	14.6	13.1	14.0			18.5	23.4	23.1	17.8	14.3	
Carm/TR					6.2	7.9	4.7	9.0	10.8		18.1	16.0	10.4	9.3	
Carm/146									19.6	16.2	21.7	21.9	19.9	15.1	

Notes:

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

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

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

(2) Distance corrected to the nearest relevant public exposure

Appendix B: A Summary of Local Air Quality Management

Purpose of an Annual Progress Report

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

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

Air Quality Objectives

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

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

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

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as	Date to be achieved by
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean	31.12.2005
Particulate Matter (PM_{10})	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean	31.12.2010
Particulate Matter (PM_{10})	40µg/m^3	Annual mean	31.12.2010
Sulphur dioxide (SO_2)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
Sulphur dioxide (SO_2)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
Sulphur dioxide (SO_2)	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	16.25µg/m^3	Running annual mean	31.12.2003
Benzene	5µg/m^3	Annual mean	31 12 2010
1,3 Butadiene	2.25µg/m^3	Running annual mean	31.12.2003
Carbon Monoxide	10.0mg/m^3	Maximum Daily Running 8-Hour mean	31.12.2003
Lead	0.25µg/m^3	Annual Mean	31.12.2008

Appendix C: Air Quality Monitoring Data QA/QC

QA/QC of Diffusion Tube Monitoring

NO_2 Diffusion Tube monitoring

Monitoring has been completed in adherence with the 2021 Diffusion Tube Monitoring Calendar, provided on the LAQM website. Due to the number of diffusion tubes located across the County, it is not feasible to collect and replace the tubes on the same day, however they are collected and replaced within 1-2 days of the suggested calendar dates to ensure the exposure period can be reported. There were no divergences from this during 2021 for the reported results.

SOCOTEC Didcot prepares and analyses the diffusion tubes on behalf of Carmarthenshire County Council. The tubes are prepared by spiking acetone:triethanolamine (50:50) mixtures onto the grids prior to the tubes being assembled. The tubes were desorbed with distilled water and the extract analysed using a segmented flow autoanalyser with ultraviolet detection.

The analysis of diffusion tube samples to determine the amount of nitrogen dioxide present on the tube is within the scope of their UKAS accreditation schedule. In the AIR PT intercomparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, SOCOTEC currently holds the highest rank of a **Satisfactory** laboratory.

Tube Precision

SOCOTEC Didcot uses a preparation method of 50% TEA in Acetone and carried out 28 studies in 2021 for this method, 25 of which were rated ‘Good’ precision results for Nitrogen Dioxide diffusion tube colocation studies and 3 rated ‘bad’. Tube precision is rated as good where the coefficient of variation (CV) of eight or more diffusion tube replicate periods is less than 20% and the average CV of all monitoring periods is less than 10%. None of their studies was rated ‘poor’ precision. The distinction between "good" and "poor" precision is an indicator of how well the same measurement can be reproduced. This precision will reflect the laboratory’s performance/consistency in preparing and analysing the tubes, as well as the subsequent handling of the tubes in the field.

This information was obtained from the document 'Tube Precision 2021 version 09-22 Final' located on the Defra LAQM Helpdesk website.

AIR PT Results

AIR is an independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). AIR offers a number of test samples designed to test the proficiency of laboratories undertaking analysis of chemical pollutants in ambient indoor, stack and workplace air.

AIR PT started in April 2014, which combined two long running PT schemes: LGC Standards STACKS PT scheme and HSL WASP PT scheme. AIR NO2 PT forms an integral part of the UK NO2 Network's QA/QC and is a useful tool in assessing the analytical performance of those laboratories supplying diffusion tubes to Local Authorities for use in the context of Local Air Quality Management (LAQM).

The results below are for SOCOTEC, Didcot [1].

Table C.1– AIR PT Rounds

AIR PT Round	AIR PT AR036	AIR PT AR037	AIR PT AR039	AIR PT AR040	AIR PT AR042	AIR PT AR043	AIR PT AR045	AIR PT AR046
Round conducted in the period	January – February 2020	May – June 2020	July – August 2020	September – October 2020	January – February 2021	May - June 2021	July – August 2021	September – October 2021
SOCOTEC [1]	100 % [1]	NR [3]	NR [3]	100 % [1]	100 % [1]	100 % [1]	100 [1]%	100 %

[1] Participant subscribes to two sets of test samples (2 X 4 test samples) in each AIR PT round.

The above details were obtained from the document '2021 LAQM NO2 Performance data up to June 2022_v2 ' located on the Defra LAQM Helpdesk website.

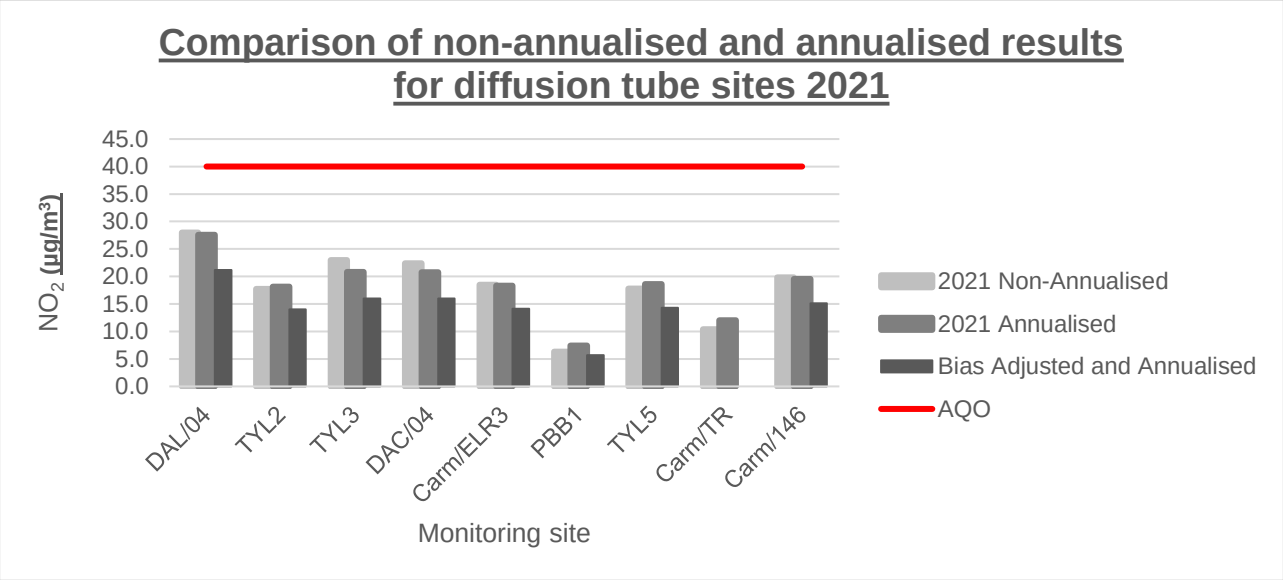
Diffusion Tube Annualisation

Annualisation is required for any site with data capture less than 75% but greater than 25%. Nine NO_2 Diffusion Tube sites captured less than 75% valid data during the 2021 calendar year, and therefore required an adjustment to calculate the short term into long term data, called annualisation. Using the method provided in Technical Guidance TG (16) it is possible to estimate what the annual mean concentration may have been had there been 12 months of data capture for the tube site. This was achieved using the LAQM Diffusion Tube processing tool which encompasses the methodology of the LAQM Diffusion Tube date processing Tool (v.2). 2021 data from four automatic monitoring sites

at other locations within the Country was used, averaging the data and attaining a ratio figure for use with the sites under review. The sites used for this exercise were Narberth, Newport, Cwmbran Crownbridge and Leominster. Further details of the calculation method undertaken is provided in Table C.3.

All the sites subject to annualisation complied with the AQO and a comparison of the results can be seen in the graph below:

Figure C.1 : Comparison of Non-Annualised and Annualised Results



The annualisation exercise revealed that minor amendments need to be applied to these final reported results to reflect a more representative annual mean, had there been 12 months valid data capture. None of the tube sites requiring annualisation exceeded the annual air quality objective of 40µg/m^3. There are some minor and insignificant differences between the annualised readings determined by the annualisation exercise using the background AURN automatic monitoring data, as all results were within 1-2µg/m^3 of the non-annualised raw data. The annualised and bias adjusted final results have been used for the purpose of reporting within this Annual Progress Report and noted in Table 2.2 – Annual Mean NO_2 Monitoring Results (µg/m^3).

Diffusion Tube Bias Adjustment Factors

Carmarthenshire County Council have applied a national bias adjustment factor of 0.77 to the 2021 monitoring data. A summary of bias adjustment factors used by Carmarthenshire County Council over the past five years is presented in Table C.2.

The national bias adjustment factor was used because a co-location study has not been carried out locally. The latest version of the tube bias adjustment spread sheet is 09/21 (final),

as detailed on the Review and Assessment Helpdesk website. SOCOTEC have 28 studies listed for 2022 that gives an overall bias adjustment figure of 0.77 for 2021. This bias adjustment figure has been applied to all the diffusion tube monitoring results in Carmarthenshire.

Carmarthenshire County Council has not carried out a co-location study to derive a local factor.

Table C.2 – Bias Adjustment Factor

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

NO_2 Fall-off with Distance from the Road

Two diffusion tubes NO_2 monitoring location within Carmarthenshire required distance correction during 2021, because the annual mean concentration was greater than 36µg/m^3 and the monitoring site is not located at a point of relevant exposure. The Diffusion Tube Processing Tool was used to calculate the distance correction and the outcome is presented in Table C3 below.

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

Site ID	Annualisation Factor Narberth	Annualisation Factor Cwmbran Crownbridge	Annualisation Factor Newport	Annualisation Factor Leominster	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
DAL/04	0.9090	1.0072	1.0522	0.9729	0.9853	28.0	27.6	
TYL2	0.9506	1.0256	1.0674	1.0455	1.0223	17.7	18.1	
TYL3	1.0487	0.8544	0.8466	0.8808	0.9076	23.0	20.8	
DAC/04	0.9745	0.9123	0.9237	0.9069	0.9293	22.4	20.8	
Carm/ELR3	0.9786	1.0091	1.0057	0.9662	0.9899	18.5	18.3	
PBB1	1.0405	1.2425	1.2027	1.1911	1.1692	6.4	7.4	
TYL5	1.0509	1.0496	1.0216	1.0657	1.0469	17.8	18.6	
Carm/TR	1.1818	1.1867	1.0794	1.1948	1.1607	10.4	12.1	
Carm/146	1.1421	0.9441	0.8893	0.9670	0.9856	19.9	19.6	

Table C.4 – NO_2 Fall off With Distance Calculations (concentrations presented in µg/m^3)

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted	Background Concentration	Concentration Predicted at Receptor	Comments
DAL/07	0.8	1.3	37.4	9.1	34.6	
DAC/08	1.1	1.5	38.8	8.9	*36.8*	*Predicted concentration at Receptor within 10% the AQS objective.*

Appendix D: AQMA Boundary Maps

Figure D.1 – Llandeilo AQMA Boundary Map

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Figure D.2 – Carmarthen AQMA Boundary Map

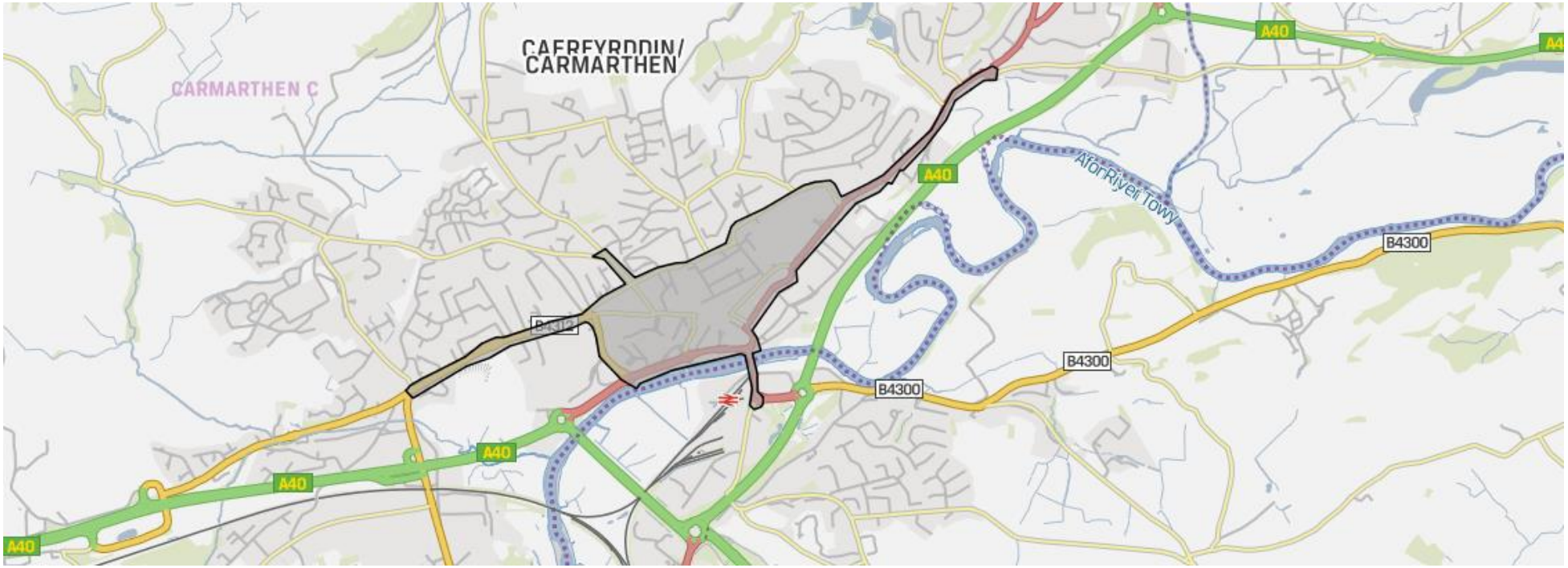
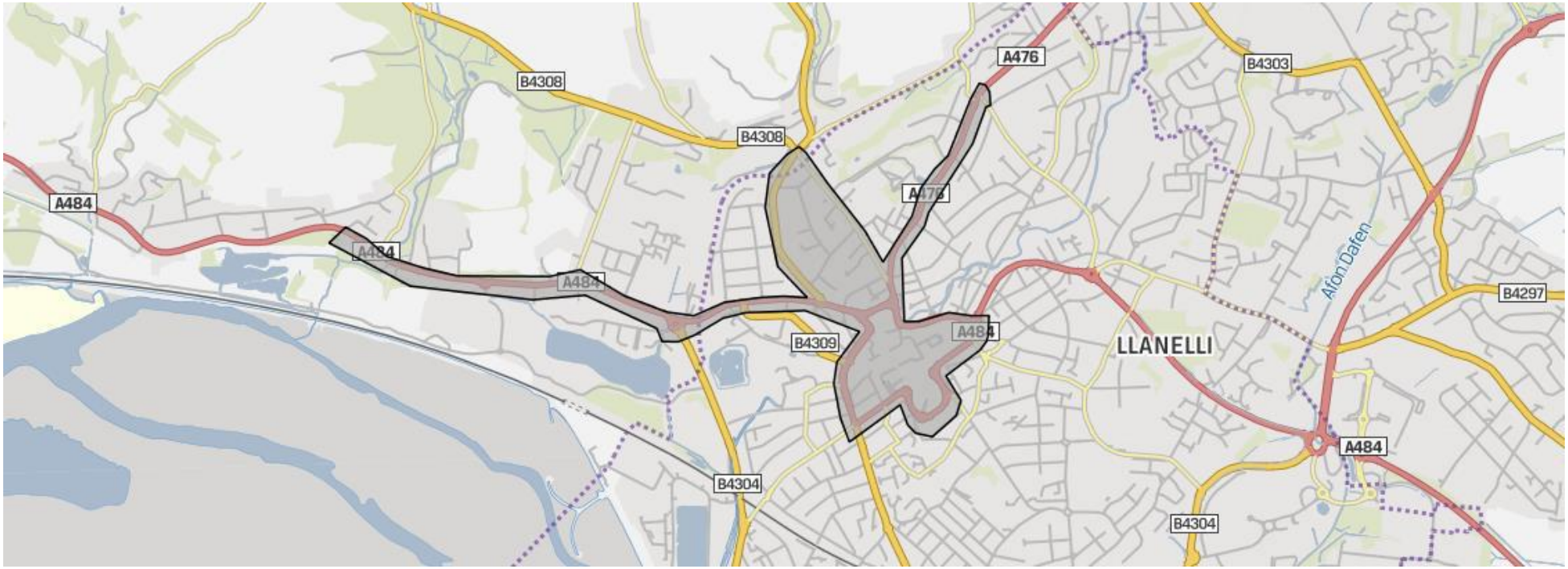


Figure D.3 – Llanelli AQMA Boundary Map



Glossary of Terms

Abbreviation	Description
ATF	Active Travel Fund
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
AQO	Air Quality Objective
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
PSB	Public Safety Board
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide
ULEV	Ultra Low Emission Vehicle