Ceredigion County Council

2023 Air Quality Progress Report

In fulfilment of Part IV of the Environment Act 1995 Local Air Quality Management

Date: November 2023

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Report Reference Number	CCC/AQ/2023
Date	29/11/2023

Executive Summary: Air Quality in Our Area

Air Quality in Ceredigion

This Air Quality Strategy Progress Report confirms, as in previous years, that **all existing statutory air quality Standards and Objectives** were complied with in 2022, at all locations in Ceredigion. As in previous years, therefore, it is not considered necessary to progress to more detailed assessments of air quality in Ceredigion or to declare any Air Quality Management Areas (AQMAs).

Ceredigion's main source of air pollution is that of vehicle emissions, from the county's road network. The County's economy is also heavily reliant on tourism, with the population of the county doubling during summer school holiday periods leading to increases in vehicle emissions. Despite this, measured trends for NO_2 in recent years at "hot-spot" locations in the county are downward with no exceedances of the standards detected at any locations (including road-side and "worst-case" locations).

Data Modelling conducted by DEFRA, indicated that Ceredigion's air was subjected to less than 13µg/m3 as an annual mean of PM_{10} in 2022. This included our busiest town namely, Aberystwyth. Air pollution in Ceredigion, specially relating to Nitrogen Dioxide and PM_{10}, continues to be amongst the lowest in Wales.

Actions to Improve Air Quality

The monitoring data collected for 2022 did not identify any requirement to undertake a Detailed Assessment or for the declaration of an AQMA. The authority however, continues to monitor the air quality of the area and reviews captured data on an ongoing basis to inform whether reactive action is required.

Local Priorities and Challenges

The previous two Annual Progress Reports sought to focus specifically on the impact of COVID-19 pandemic restrictions on localised air pollution. For example, temporary pedestrianisation was implemented in towns subject to high levels of tourism. The finding of previous reports was that pedestrianisation did not have a notable impact on localised NO_2 concentrations and levels remained well within statutory limits. The pandemic also brought

about data capture challenges in that diffusion tubes could not be collected for many months. This meant that data from continual monitoring sites in Pembrokeshire and Shropshire had to be used as part of an annualization procedure.

The intended focus of this year's report was to observe the impact of dropping lockdown restrictions on localised air pollution due to the expected increase in road traffic and tourism. The data captured in 2022 however, found that monitoring locations observed an approximate reduction of 20% in annual mean concentration of NO_2 in relation to 2021 levels.

A possible explanation for this reduction is that Nitrogen dioxide monitoring in 2022 benefited from full data capture at all locations unlike in the previous two years. This could suggest that the annualization procedure in 2021 led to a higher than usual observed values at the monitoring locations.

In 2022, Talybont was once again found to have the highest annual mean concentration of NO_2 at 17.2 µg/m3, however this was down from the mean of 24µg/m3 observed in 2021 in line with the trend noted at other locations. The higher mean noted in this location is likely due to the busy Trunk Road going through the town that is often subject to commuters to Aberystwyth, HGVs traveling through the county and tourists visiting the county in summer months. This concentration is currently still well within the statutory limit and the site will continue to be monitored in future.

How to Get Involved

Members of the public can obtain further information on air quality by contacting the report author.

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1 Actions to Improve Air Quality

1.1 Previous Work in Relation to Air Quality

In previous Air Quality Strategy Progress Reports it was established that there were no exceedances of air quality standards for any of the priority air pollutants contained in Regulations at any location in Ceredigion (including at congested roadsides). Furthermore, no exceedances were anticipated in the future on the basis of observed trends and modelled predictions.

A checklist approach and screening tools have historically been used to identify potential sources of air pollution in the county over many years. All possible sources of air pollution suggested in Technical Guidance have been considered with the ongoing monitoring of NO_2 having been deemed as necessary. Monitoring locations are regularly reviewed in line with emerging issues and developments as recommended in guidance etc. The last Progress Report for Ceredigion was submitted in 2022 and was accepted by Welsh Government as accurately representing the state of air quality in Ceredigion. Results presented in the report were generally in accord with national projections.

There are no significant sources of industrial air pollution in Ceredigion - industrial, road and other developments in recent years have been relatively low impacting in air quality terms.

It was reported in a previous Progress Report (using data modelled by DEFRA for 2015) that estimated PM2.5 concentrations approached a Scottish standard of 10µg/m_3 (also the World Health Organisation guideline standard) at some congested roadside locations in the main town of Aberystwyth. Results modelled by DEFRA at road-side locations in Aberystwyth in 2018, however, were lower (between 6 and 8µg/m_3). This is below the mandatory Scottish and World Health Organisation guideline standard. PM2.5 is an important health related parameter and the Scottish mandatory and WHO guideline standard is a stringent one that will be difficult to achieve at some roadside locations in the UK.

It has not been considered necessary to declare any air quality management areas in Ceredigion or to develop action plans to improve air quality in the county. There were no significant new developments in the county in 2022 (industry etc.) that significantly affected air quality. Local Transport Plans, a Carbon Management Plan and Economic Development and Planning Strategies acknowledge the importance of air quality and aim to limit or reduce the impact local emissions make in the county

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

Ceredigion County Council has no Air Quality Management Areas (AQMAs) or any locations in the county where air pollutant concentrations exceed / approach national standards / objectives. It has not been necessary, therefore, to develop Air Quality Action Plans or an Air Quality Strategy.

1.3 Implementation of Action Plans

There are no Air Quality Management Areas in Ceredigion. It has not been necessary to develop and implement Action Plans or to produce an Air Quality Strategy.

2 Air Quality Monitoring Data and Comparison with Air Quality Objectives

2.1 Summary of Monitoring Undertaken in 2022

2.1.1 Automatic Monitoring Sites

There are currently no automatic monitoring sites operating within Ceredigion.

2.1.2 Non-Automating Monitoring Sites

Ceredigion County Council undertook non- automatic (passive) monitoring of NO_2 at eleven locations during 2022. Table 2.1 presents the details of the sites.

Maps showing the locations of the monitoring sites are provided in Figure 2.1. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

Table 2.1 – Details of Non-Automatic Monitoring Sites

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 Monitor (m)
Terrace Road, Aberystwyth	Urban Centre	N/A	258470	281700	2.5	N	1	1
Thespian Street, Aberystwyth	Urban Centre	N/A	258630	281800	2.5	N	10	1
Railway Station, Aberystwyth	Urban Centre	N/A	258500	281620	2.5	N	1	1
Morrisons Roundabout, Aberystwyth	Roadside	N/A	259590	280570	1.5	N	200	1
Mill Street, Aberystwyth	Industrial	N/A	258379	281519	1.5	N	1	1
High Street, Lampeter	Urban Centre	N/A	257790	248140	1.5	N	1	1
High Street, Cardigan	Urban Centre	N/A	217790	246180	1.5	N	1	1
Quay Street, Cardigan	Urban Centre	N/A	217661	245959	1.5	N	1	1
Pendam	Rural	N/A	272240	283330	1.5	N	500	1
Talybont	Roadside	N/A	265462	289275	1.5	N	1	1

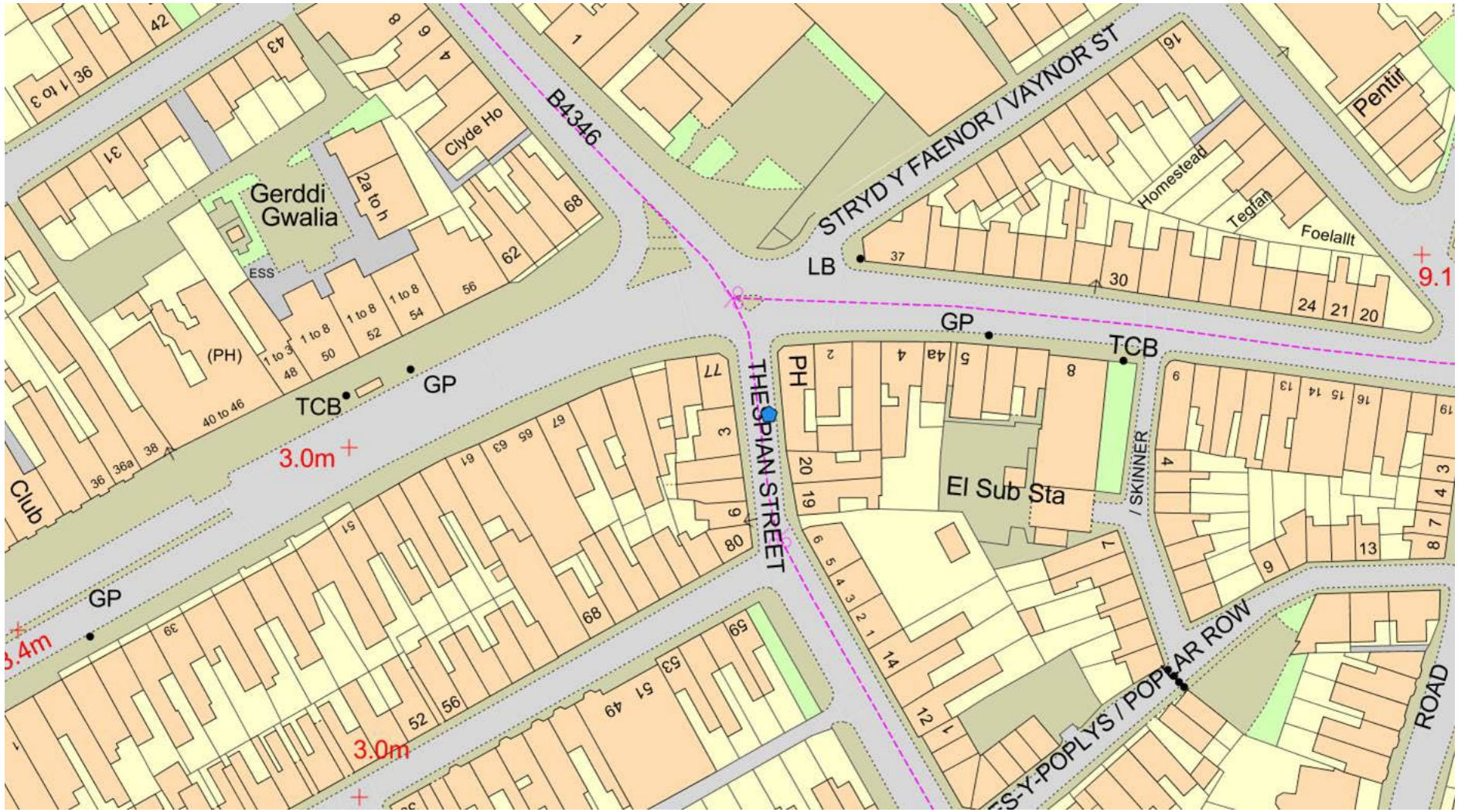
Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Monitor (m)
Great Darkgate Street, Aberystwyth	Urban Centre	N/A	258230	281631	1.5	N	1	3

Notes:

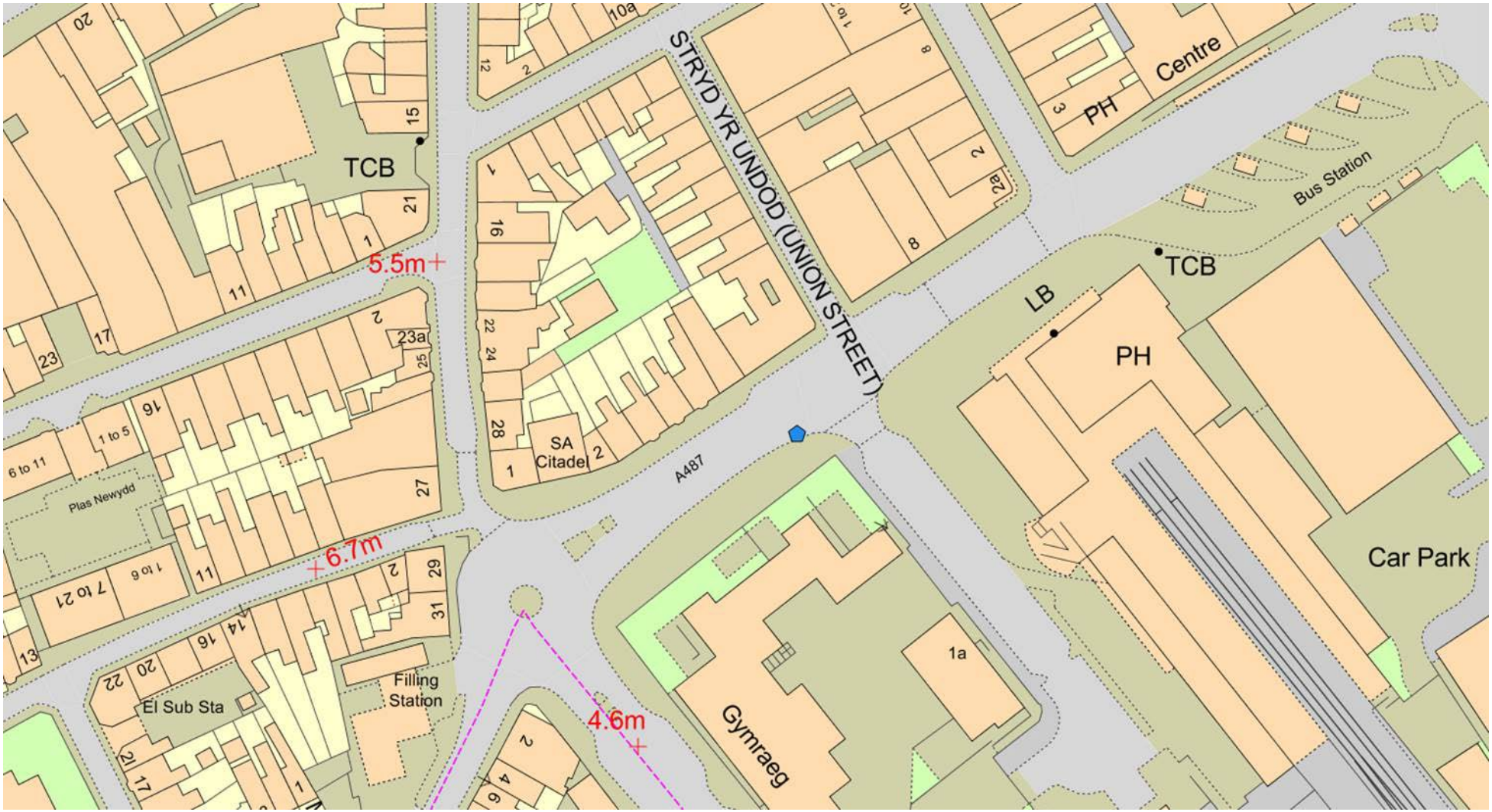
(1) 0m indicates that the sited monitor represents exposure and as such no distance calculation is required.

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

Terrace Road, Aberystwyth

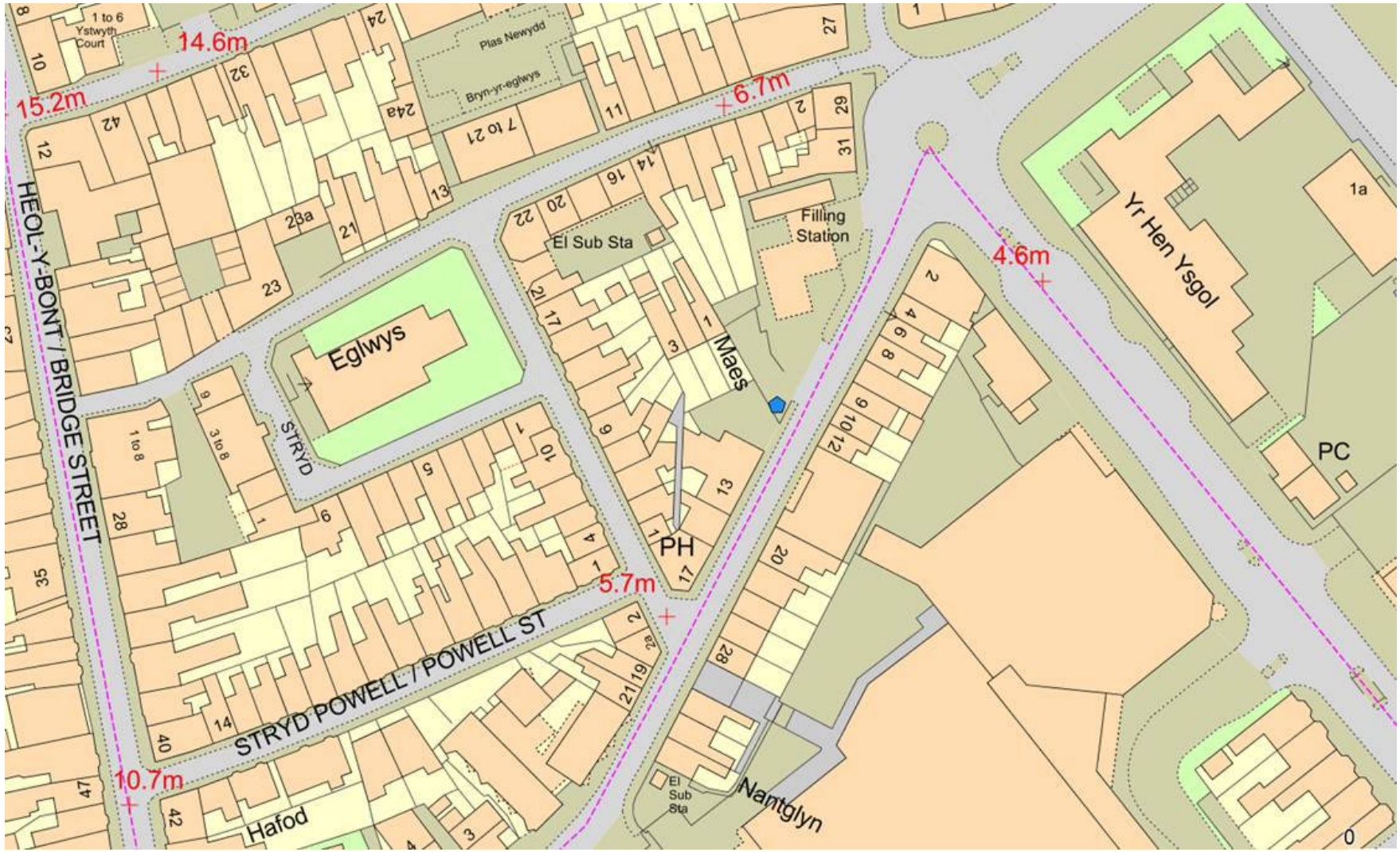


Thespian Street, Aberystwyth

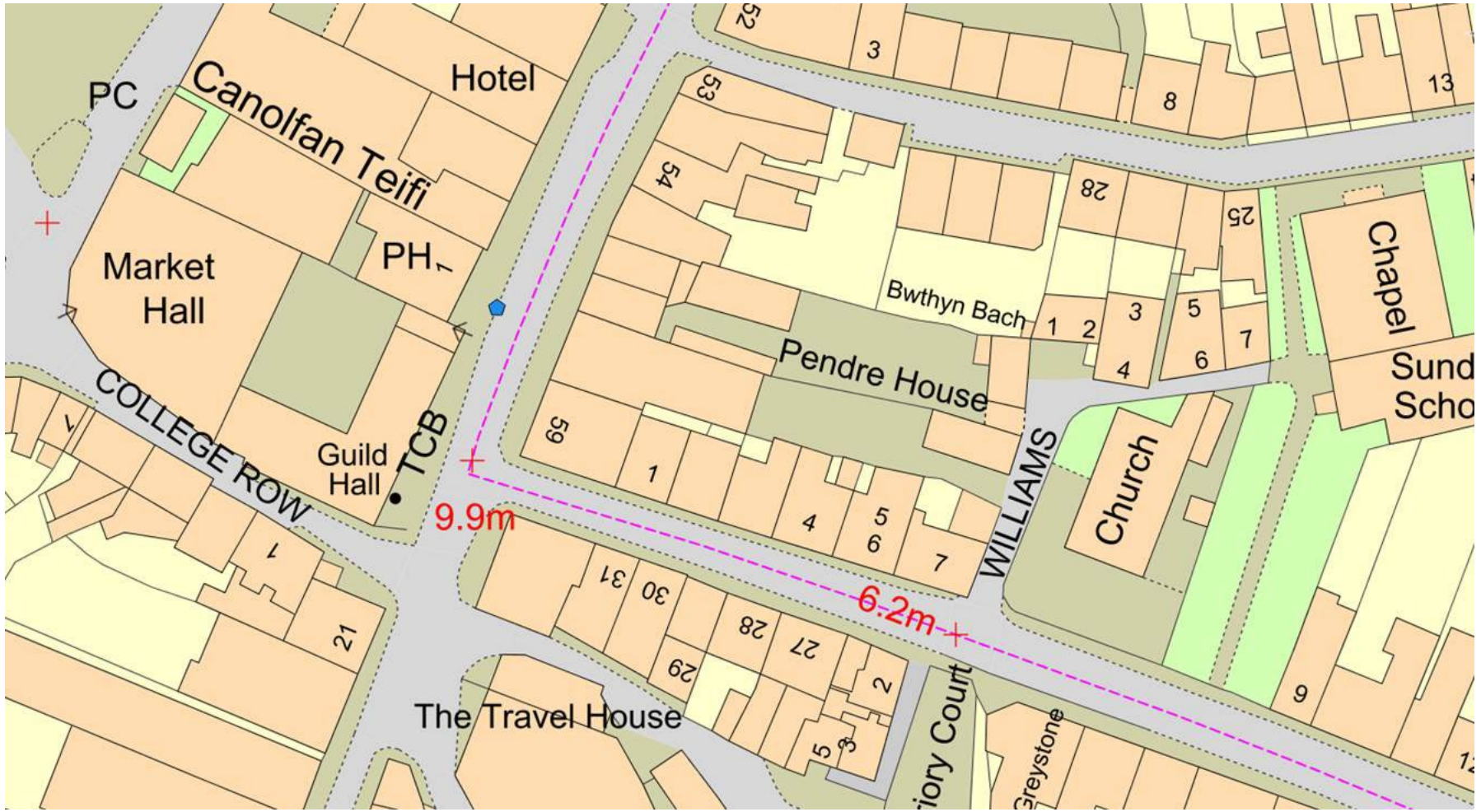


Railway Station, Aberystwyth

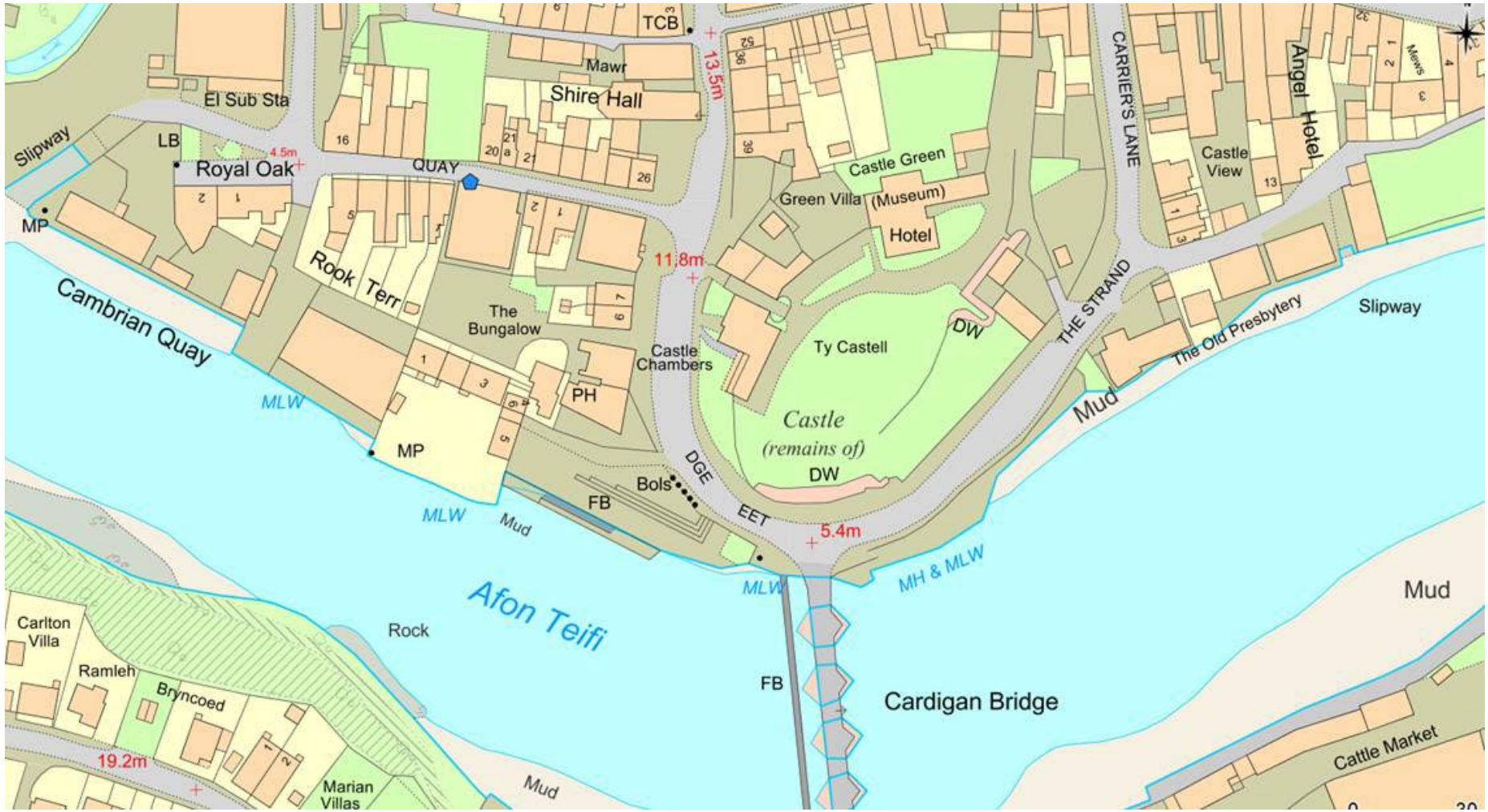
Morrison's Roundabout, Aberystwyth



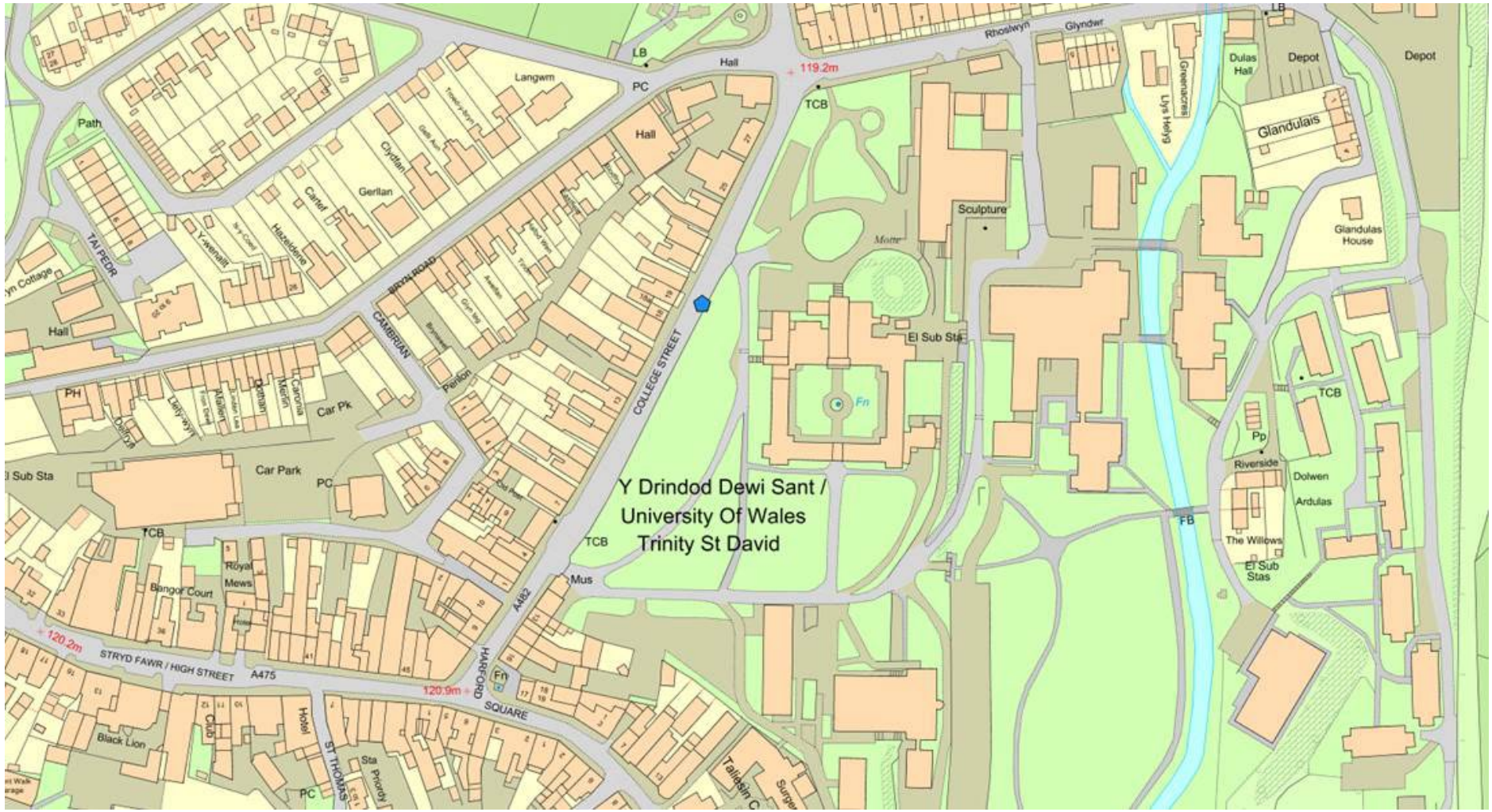
Mill Street, Aberystwyth



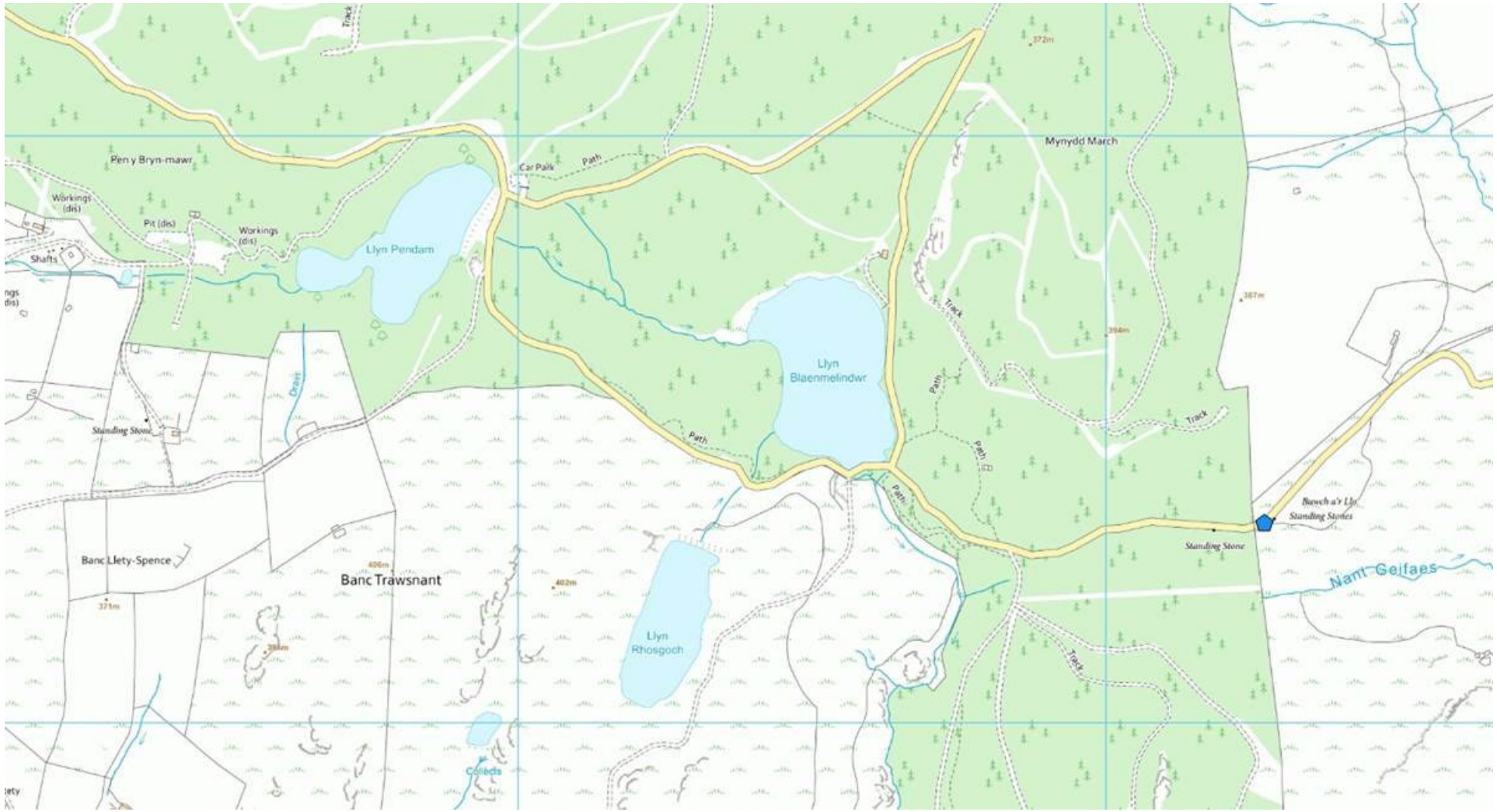
High Street, Cardigan



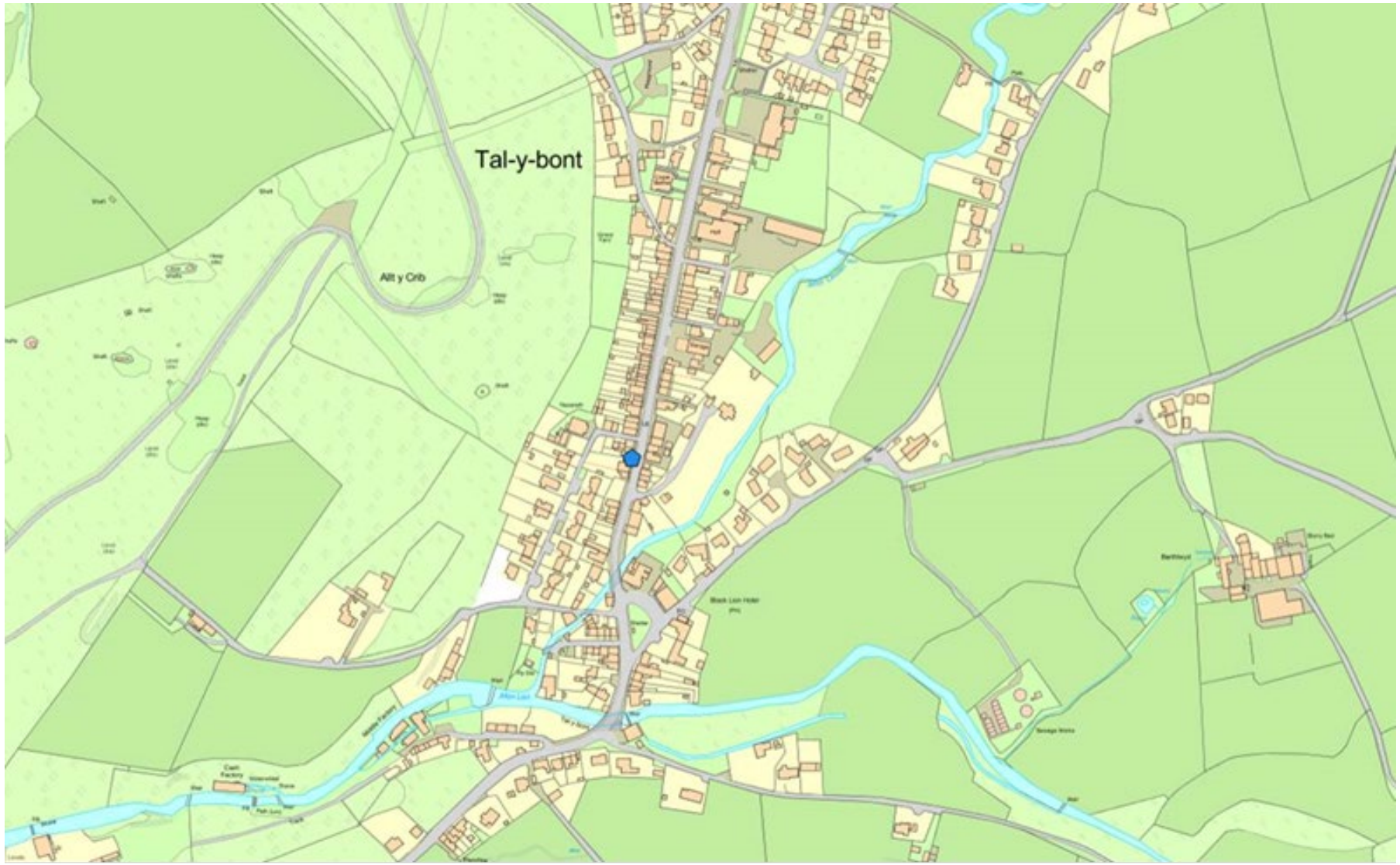
Quay Street, Cardigan



High Street, Lampeter


Pen y Bryn-mawr
Workings (dis)
Pit (dis)
Workings (dis)
Shafts
Car Park
Path
Llyn Pendam
Mynydd March
372m
Track
Llyn Blaenmelindwr
Path
Track
387m
394m
Standing Stone
Drain
Banc Llety-Spence
371m
Banc Trawsnant
406m
402m
384m
Llyn Rhosgoch
Track
Standing Stone
Banwch a'r Llo Standing Stones
Nant Geifaes
Colbds

Pendam



Talybont

Great Darkgate Street, Aberystwyth

2.2 2022 Air Quality Monitoring Results

Table 2.2 – Annual Mean NO_2 Monitoring Results (µg/m^3)

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	**2022**
Terrace Road, Aberystwyth	Urban Centre	Diffusion Tube	100	100	17.5	19.6	16.3	20.4	15.6
Thespian Street, Aberystwyth	Urban Centre	Diffusion Tube	100	100	21.5	18.3	15.8	20.3	15.8
Railway Station, Aberystwyth	Urban Centre	Diffusion Tube	100	100	23.3	20.3	17.0	20.7	15.1
Morrisons Roundabout, Aberystwyth	Roadside	Diffusion Tube	100	100	18.4	17.5	13.8	16.6	12.7
Mill Street, Aberystwyth	Urban Centre	Diffusion Tube	100	100	18.6	18.9	16.5	22.2	15.3
High Street, Lampeter	Urban Centre	Diffusion Tube	100	100	21.2	15.6	15.0	16. 2	12.9
Quay Street, Cardigan	Urban Centre	Diffusion Tube	100	100	n/a	n/a	10.1	8.2	6.4
High Street, Cardigan	Urban Centre	Diffusion Tube	100	100	16.4	18.4	17.7	16.6	13.0
Talybont	Roadside	Diffusion Tube	100	100	n/a	n/a	n/a	24.5	17.2
Great Darkgate Street, Aberystwyth	Urban Centre	Diffusion Tube	100	100	n/a	n/a	n/a	12.7	9.8
Pendam	Rural Background	Diffusion Tube	100	100	n/a	n/a	2.8	2.4	1.9

Notes:

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

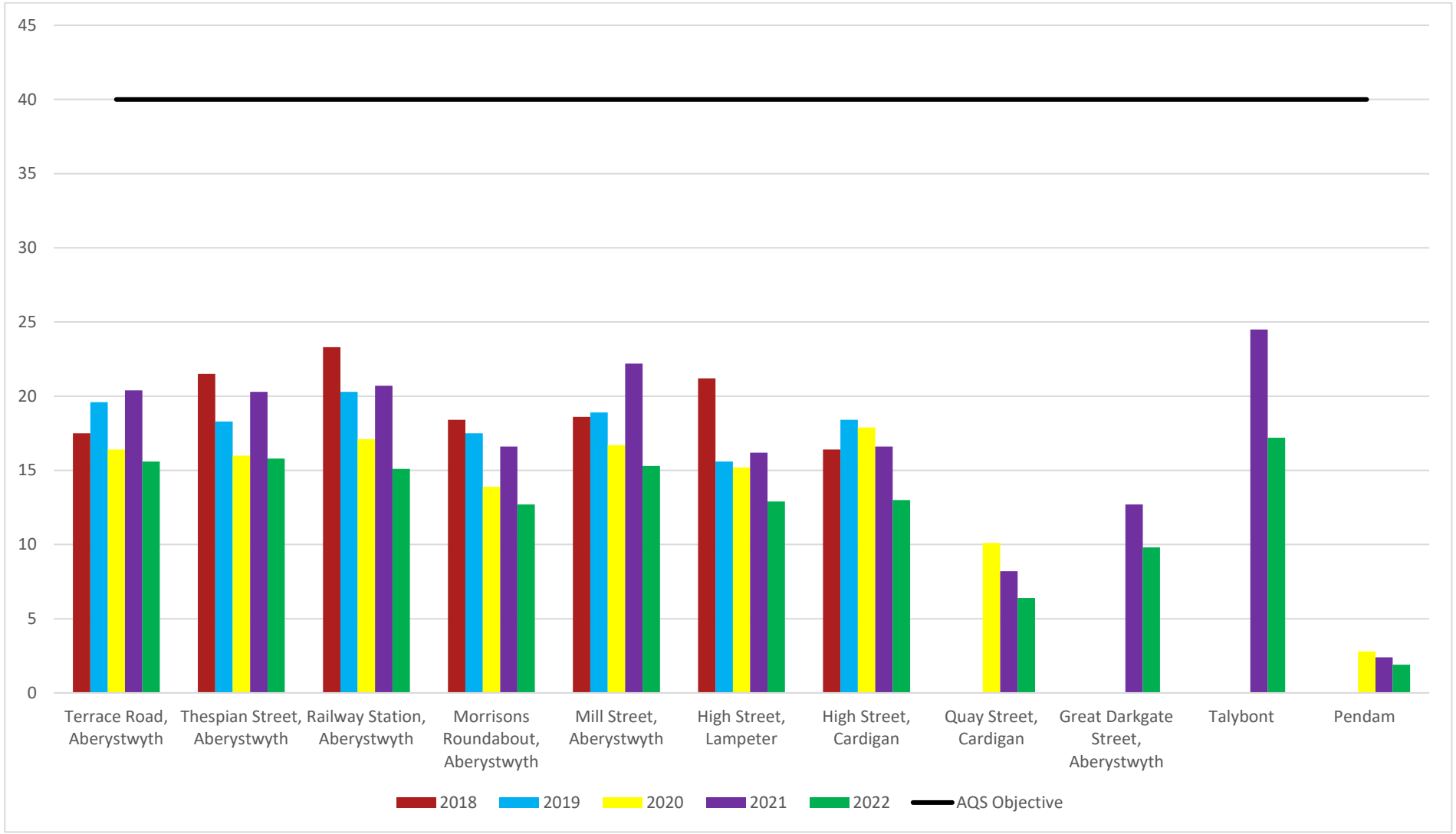
NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

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 2.2 – Trends in Annual Mean NO_2 Concentrations (µg/m^3)



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

During 2022, Ceredigion County Council collected diffusion tube data for NO_2 at eleven locations (including the Pendam, Rural Background site). Site details are outlined in Table 2.1- 'Details of Non-Automatic Monitoring Sites' with maps of each site being provided in Figure 2.1- 'Non-Automatic Monitoring Sites'.

Comparison of 2022's data in relation to previous years is outlined in Table 2.2- 'Annual Mean NO_2 Monitoring Results' and is illustrated in Figure 2.2- 'Trends in Annual Mean NO_2 Concentrations'. A breakdown of monthly data gathered in 2021 is outlined in Table A.1- 'Full Monthly Diffusion Tube Results for 2022'.

2.3.1 Nitrogen Dioxide (NO_2)

Valid data capture was achieved at 100% for all monitoring locations. The high data capture meant that an annualisation procedure did not need to be implemented in 2022 unlike the previous two years. Monitoring for NO2 at Talybont and Great Darkgate Street, Aberystwyth was only started in January 2020 hence the lack of previous year data in Table 2.2.

The annual mean concentration data recorded for NO_2 during 2022 at each of the monitoring locations, as presented in Table 2.2, did not exceed the annual mean NO_2 AQS objective level of 40µg/m3 (see Appendix B).

As displayed in Figure 2.2, with the exception of 2021 data the NO_2 annual mean concentrations monitored at all monitoring locations have seen a general steady decrease without interventions in the form of AQMAs having been implemented. Annual Mean data from 2022 was consistent with this downward trend.

The new monitoring location of Talybont was found to have the highest annual mean concentration of NO_2 at **17.2µg/m^3**. This is likely due to the busy Trunk Road going through the town that is often subject to commuters to Aberystwyth, HGVs traveling through the county and tourists visiting the county in summer months. This concentration is currently still well within the statutory limit and the site will continue to be monitored in future.

2.3.2 Particulate Matter (PM_{10})

Ceredigion County Council does not monitor for PM_{10} however data modelling conducted by DEFRA, indicated that Ceredigion's air was subjected to less than 13µg/m3 as an annual mean of PM10 in 2022. This included our busiest town namely, Aberystwyth.

2.3.3 Particulate Matter ($PM_{2.5}$)

Ceredigion County Council does not monitor for $PM_{2.5}$.

2.4 Summary of Compliance with AQS Objectives as of 2022

Ceredigion County Council has examined the results from monitoring in the county of Ceredigion. Concentrations are all below the Objectives, therefore no further action is required.

3 New Local Developments

3.1 Road Traffic Sources (and Other Transport)

There were no new Road traffic Sources of significance identified in Ceredigion, in 2022, in accordance with the guidance.

3.2 Industrial / Fugitive or Uncontrolled Sources / Commercial Sources

There were no new Industrial/Fugitive or Uncontrolled Sources/Commercial Sources of significance identified in Ceredigion, in 2022, in accordance with the guidance.

3.3 Other Sources

There were no other new sources of significance identified in Ceredigion, in 2022, in accordance with the guidance.

Other than road traffic sources, Ceredigion 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.

Ceredigion 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

There are no AQMAs declared in Ceredigion. Therefore, there are no AQAPs. As Ceredigion is a largely rural county Air Quality is generally good, and there are no policies or strategies that have been produced that specifically focus on Air Quality.

4.2 Air Quality Planning Policies

Pollution control and planning systems have tended to evolve over the years as separate entities. Authorisations under the pollution control regimes aim to control the ways in which prescribed processes operate, in order to limit and render harmless any pollution emitted to the atmosphere. The planning system, however, regulates the location of development and the control of operations in order to avoid or minimise the adverse effects that any potential for pollution may have on the use of land and the environment, to the extent that it may affect present or future land use.

It is recognised in Ceredigion that land use planning is an important part of an integrated approach to achieving air quality objectives and reducing the emissions of air pollutants (including those that contribute to global warming). A Ceredigion Unitary Development Plan (UDP) provided guidance on how planning applications should be viewed by the Local Planning Authority. The main objectives of the UDP, that impact on air quality included:

a**. Objective Gen 1** - to encourage a pattern of land use that focuses development in areas that minimize demand for travel and have the capacity to support it;

d. **Objective GEN 4** - to ensure development is appropriately located, well designed and minimizes impacts on the environment;

e. **Objective ENVE1** - to promote efficient uses of energy in development and to encourage environmentally friendly energy generation systems;

g. **Objective ENVU 1** - to encourage sustainable investment and improvements in infrastructure facilities to cater for existing and future needs, without compromising the quality of the environment.

The UDP also contained specific policy relating to Air Quality as follows:

ENVP1.4 Air Quality (UDP) – states that:

“Proposals should not pose significant additional harm to air quality”. Where possible proposals should:

1. Be appropriately located in order to reduce the need to travel

2. Be accessible by a choice of means of transport

3. Promote the use of energy efficient methods

.

Work on the UDP was stopped when the Authority resolved to develop a local development plan (LDP) for Ceredigion. This is a live and on-going Plan, that carefully considers matters relating to air quality, that will continue to be developed and reviewed in the future but containing the same underlying principles in relation to air quality and mitigating local impacts.

4.3 Local Transport Plans and Strategies

The Mid Wales Joint Local Transport Plan has been jointly produced by the three Mid Wales Local Authorities (LAs) of Ceredigion, Powys and Gwynedd (for Meirionnydd). The LTP is a statutory document that sits alongside the LDP. The vision of the LTP is for the Mid Wales LAs to plan for and deliver in partnership an integrated and affordable transport system in the region that facilitates economic development, ensures access for all to services and opportunities, sustains and improves the quality of community life, and makes an active contribution to the management of carbon and the quality of the environment. Outcomes of the LTP that benefit Air Quality include:

• **Improving Health and Well-being by Increasing Walking and Cycling**: Levels of cycling and walking for both necessary active travel and recreation, by residents and visitors, will be increased.

• **Benefits and Minimised Impacts on the Environment**: The potential for transport movements to reduce carbon emissions and improve the local and global natural and built environment will have been maximised and negative impacts minimised, including adaption to the effects of climate change.

A set of higher-level interventions have been developed that together aim to deliver the outcomes sought for the LTP, which includes:

- **Improving Strategic Connections.**
- **Improving Accessibility to Employment and Services.**
- **Encouraging Walking and Cycling.**
- **Integrated Public Transport Networks.**

4.4 Active Travel Plans and Strategies

The Active Travel (Wales) Act 2013 was introduced in 2014 and required local authorities to continuously improve facilities and routes for pedestrians and cyclists and to prepare maps identifying current and potential future routes for their use. The Act required new road schemes (including road improvement schemes) to consider the needs of pedestrians and cyclists at the design stage. The Act is intended to enable more people to walk and cycle and generally travel by non-motorised means. Making walking and cycling safer and more practical encourages healthier lifestyles, reduces air pollution, reduces noise, reduces carbon emissions and improves the environment.

The aim of the Active Travel Plan in Ceredigion is to improve Health and Well-being of locals and visitors by increasing walking and cycling. Infrastructure improvements and behavioural change initiatives in Ceredigion aim to increase levels of walking and cycling both for necessary, active travel and for leisure and includes factors such as road bridges, cycle routes, footway/ footpath provision, safe routes to school, travel planning as well as road safety measures to assist vulnerable users. Ceredigion County Council submitted its route maps to Welsh Government in 2015.

4.5 Local Authorities Well-being Objectives

Air pollution is considered to be the biggest environmental contributor to the burden of disease in the UK. People already suffering from poor health and/or who live in the areas of poorest air quality are more likely to be affected by air pollution. Poorer urban communities are disproportionately affected.

The associated health effects do not only relate to the more obvious and direct impacts of air pollution. Air pollution affects the growth of crops and contributes to the acidification of inland and coastal waters. This can lead to important impacts on the food chain.

The Welsh Government considers it important that all local authorities commit themselves to ensuring that air pollution remains below objective levels. The Welsh Government has suggested that local authorities should include air quality management in corporate and over-arching strategies to raise its profile and deliver actions in an integrated manner. To this end, it is important that local authorities apply the sustainable development ideal in their work and are able to demonstrate to the public that they are making progress towards achieving the seven well-being goals defined in the, “Well-being of Future Generations (Wales) Act 2015”; *Well-being of Future Generations (Wales) Act 2015*

The Act requires local authorities to set well-being objectives and publish an annual report showing the progress made in achieving the objectives. Local authorities are required to ensure that information from reviews and assessments of local air quality informs local well-being and is incorporated into the local well-being plan. This should emphasise the local authority’s role in delivering cleaner air. It should aim to raise the profile of air quality keeping the issue high on its list of local priorities. Welsh Government encourages local authorities to deliver air quality improvements in a corporate and multi-disciplinary way enabling them to build air quality considerations into wider policy areas - such as land use planning, transport planning, energy efficiency, waste management, economic development and regeneration. Local authorities are also urged to attempt to work more closely with neighbouring authorities - thereby strengthening the role of regional groupings.

The Act recognises that Wales also faces other major global challenges - such as climate change. Global warming and climate change are driven by emissions to the atmosphere. National targets have been set for reducing carbon emissions and “Climate Change and Natural Resources” is one of the six Public Service Boards that is contributing to the development and delivery of the Well-being of Future Generations (Wales) Act 2015 in Ceredigion. This group meets on a regular basis in Ceredigion and is currently preparing and developing action plans. The Council also has a Carbon Management team that has successfully reduced local carbon emissions and now works to reduce emissions further with the aim of making the Council net carbon neutral by 2030 (in line with the Welsh Government target). Being a rural county, the public sector employs one third of Ceredigion’s population with the Local Authority being the main employer in the sector.

The authority's carbon management plan implements a target of reducing scope 1 emissions (which includes that of vehicle emission) by 15% of levels observed in 2017/18 by 2023 which is currently on course to being achieved and will be discussed in next year's annual progress report.

4.6 Green Infrastructure Plans and Strategies

The preparation of Green Infrastructure Policies, Plans and Strategies is a new requirement under Edition 10 of Planning Policy Wales. It is coordinated by the Planning Policy Team of Ceredigion County Council.

Local authorities are required to adopt a strategic and proactive approach to green infrastructure and biodiversity by producing up-to-date inventories and maps of existing green infrastructure and ecological assets and networks. Such Green Infrastructure assessments should make timely, pragmatic and inclusive use of existing datasets and the best available information to develop an integrated map-based evidence resource. Doing so will facilitate a proactive approach and enable contributions towards the Council's well-being goals to be maximised.

A Green Infrastructure Assessment is being used in Ceredigion to develop a robust approach to enhancing biodiversity, increasing ecological resilience and improving wellbeing outcomes. Stakeholder engagement events have been held in the county to guide its Green Infrastructure Assessment. The engagement exercises generated lots of interest, responses and ideas. Outputs have been collated and summarised and have identified key strategic opportunities where the restoration, maintenance, creation or connection of green features and functions can be used to deliver the most significant benefits. Detailed maps for market towns in Ceredigion, for example, reveal the current extent (and loss) of hedgerows and woodland etc in and around these town. Hedgerow and tree loss over a period of time will be used as a starting point for tree re-instatement / planting plans in Ceredigion.

Planning authorities are required to use the best available data to monitor a set of key species and habitats, and incorporate these indicators into their Annual Monitoring Reports. This data will be used to indicate whether there has been a net gain or loss of biodiversity and trends will be used to determine future priorities for planning and decision

making. The need for ecosystems, habitats and species to adapt to climate change will be considered as part of the Green Infrastructure Assessment.

Parks, open spaces, playing fields, woodlands, wetlands, road verges, allotments and private gardens are examples of green infrastructure while sustainable drainage systems, swales, wetlands, rivers, canals and their banks and other water courses are often referred to as blue infrastructure. Access to, and engagement with, this natural environment is associated with positive health outcomes, including improved physical and mental health, and reduced risk of cardiovascular disease and other chronic conditions. Access to recreational infrastructure, such as parks and playgrounds, has been found to be associated with reduced risk of obesity among adolescents and increased physical activity levels. Similarly, park improvements can increase visits / use and physical activity levels of children and older people. Living near green spaces, such as parks and other open spaces can improve health, regardless of social class.

Improving access to green infrastructure and spaces also contributes to reducing

exposure to environmental hazards and air pollution, improving air quality, reducing the impact of climate change, protecting against flooding and erosion, and increasing social participation among older adults.

5 Conclusion and Proposed Actions

5.1 Conclusions from New Monitoring Data

Ceredigion County Council has no Air Quality Management areas and has no areas close to Air Quality Strategy Objectives. It has not been considered necessary, therefore, to declare any Air Quality Management Areas or to prepare a Local / Regional Air Quality Strategy.

5.2 Conclusions relating to New Local Developments

Ceredigion County Council confirms that there are currently no new local developments that will require more detailed consideration and none that give rise for any Detailed Assessments. As in previous rounds of Review and Assessment, results reported in this Report indicate that all statutory air quality Standards and Objectives are complied with in Ceredigion by specified dates at all locations (including the most heavily trafficked roadside locations).

Monitoring and new assessments for this report have not revealed any places in Ceredigion where the combustion of fuels (in motor vehicles, industry, or in domestic properties) or fugitive emissions are causing, or are likely to cause, significant air quality problems. The review suggests that there are no traffic-related air quality problems at the busiest road locations and in the most congested towns in Ceredigion. There are no major industries close to heavily populated areas and only a small number of Part B processes and small combustion plants, in the county (mostly categorised as “low risk”).

5.3 Other Conclusions

To summarise, Ceredigion is rural with very few air-polluting industries. This list of air polluting industries has not changed since the last Progress Report for Ceredigion and road traffic continues to be the dominant source of air pollution in Ceredigion with the volume of road traffic increasing though remaining relatively low in national terms. Air quality continues to be monitored in some of the most congested and sensitive areas of Ceredigion. The purpose of this is to check compliance and confirm local and national

projections. Monitoring is also undertaken as required to identify any changes associated with changes in industrial activity, the volume and composition of traffic, road layouts, new local developments, as a result of local concerns and requests and any other factors that contribute to air pollution in the county. Monitoring for nitrogen dioxide using passive diffusion tubes is used from time-to-time in periodic baseline and screening exercises to identify any new, emerging air pollution “hot-spots” focusing in particular on schools, industrial sites, residential areas, various businesses, garages, the rail network, bus stations, dry cleaning and paint shops, and in the vicinity of new road layouts etc. Passive samplers are inexpensive and can be deployed in relatively large numbers to provide the spatial coverage and resolution necessary to effectively map an area and identify potential sources of pollution. Volumes of traffic in the county, even in the most congested town (Aberystwyth), are relatively low when compared with other parts of the country and do not approach the heavily trafficked classification described in Guidance. The ratio of heavy goods vehicles to the total number of vehicles is also low in Ceredigion because of the lack of industry.

5.4 Proposed Actions

This air quality review for Ceredigion has not identified the need to progress to more detailed assessments for any of the priority air pollutants. National Air Quality Indicators are very low for nitrogen dioxide and PM_{10} Ceredigion – amongst the lowest in Wales. Monitoring will be undertaken as necessary at any emerging hot-spot locations or as a result of any new concerns or developments. Monitoring which was set up in Talybont in 2021 due to concerns of regular traffic congestion observed on Trunk Road A487 on account of roadside parking on the main road going through of the village will continue due to it being the area with the highest observed nitrogen dioxide levels, however the levels in this area as well as all others are expected to remain within the legal limit.

As it stands, nitrogen dioxide in recent years at all “hot-spot” locations have presented no exceedances of the legal standards at any locations (including road-side and worst case locations). Monitoring will be continued at these locations in the future to ensure continuing compliance with the most stringent standards. The next Progress Report for Air Quality in Ceredigion will be prepared and submitted in September 2024.

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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 A: Monthly Diffusion Tube Monitoring Results

Table A.1 – Full Monthly Diffusion Tube Results for 2022 (µg/m^3)

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.76) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
CERE/21A/NA9S9 (Terrace Road, Aberyswtyth)	26.0	16.7	26.5	21.3	17.4	16.9	20.4	20.7	12.6	19.8	21.5	26.5	20.5	15.6	
CERE/21A/NA9S6 (Thespian Street, Aberystwyth)	26.0	17.6	28.7	22.1	17.2	15.1	17.0	19.6	17.3	18.4	21.7	28.9	20.8	15.8	
CERE/21A/NA9S10 (Railway Station, Aberystwyth)	27.3	17.7	20.9	19.2	18.2	13.6	18.6	20.2	18.7	19.6	20.7	24.2	19.9	15.1	
CERE/21A/NA9S8 (Morrison, Aberystwyth)	21.3	16.6	18.5	15.2	16.2	13.0	19.9	20.1	11.5	13.0	15.3	19.4	16.7	12.7	
CERE/21A/NA9S3 (Mill Street, Aberystwyth)	25.5	22.8	25.6	20.2	20.7	16.1	19.6	22.0	3.4	19.9	22.2	23.8	20.2	15.3	
CERE/21A/NA9S5 (High Street, Lampeter)	22.5	16.2	20.7	14.2	14.3	12.3	13.2	15.2	17.0	16.7	20.7	20.2	16.9	12.9	
CERE/21A/NA9S15 (High Street, Cardigan)	20.6	13.7	19.4	15.1	15.9	13.1	17.0	18.3	20.5	14.3	14.4	22.2	17.0	13.0	
CERE/21A/NA9S12 (Quay Street, Cardigan)	12.1	6.5	11.2	8.1	5.0	5.0	6.1	7.4	4.4	8.5	10.8	16.6	8.5	6.4	
CERE/21A/NA9S11 (Pendam)	1.9	2.0	4.1	3.0	2.7	1.6	2.0	2.9	2.3	2.3	2.1	2.5	2.5	1.9	
CERE/21A/NA9S7 (Talybont)	28.7	22.1	22.4	22.9	24.1	19.6	26.0	25.6	15.6	18.8	21.2	24.4	22.6	17.2	
CERE/21A/NA9S14 (Great Darkgate Street, Aberyswtyth)	17.8	11.1	17.3	12.2	10.1	9.0	11.4	13.0	3.7	13.5	14.9	20.2	12.9	9.8	

Notes:

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

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

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

(2) No distance corrections were required in 2022

Appendix B: A Summary of Local Air Quality Management

Purpose of an Annual Progress Report

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

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

Air Quality Objectives

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

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

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

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

Appendix C: Air Quality Monitoring Data QA/QC

QA/QC of Diffusion Tube Monitoring

Diffusion Tube Bias Adjustment Factors

The diffusion tube supply analyst was SOCOTEC Didcot, the method was 50% TEA in acetone and the bias adjustment factor used was the 2022 overall factor of 0.76 (Spreadsheet Version Number: 09/23), which was sourced from the Defra database of national bias adjustment factors [https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html].

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 09/23

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of March 2024
LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1:	Step 2:	Step 3:	Step 4:
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.
If a laboratory is not shown, we have no data for this laboratory.	If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data[2]	If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[2] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[5]	Bias Adjustment Factor (A) (Cm/Dm)
SOCOTEC Didcot	50% TEA in Acetone	2022	UI	North Lincolnshire Council	12	18	13	32.1%	G	0.76
SOCOTEC Didcot	50% TEA in Acetone	2022	R	Waverley Borough Council	11	27	20	32.7%	G	0.75
SOCOTEC Didcot	50% TEA in Acetone	2022	R	Waverley Borough Council	12	29	20	43.1%	G	0.70
SOCOTEC Didcot	50% TEA in acetone	2022		Overall Factor[3] (29 studies)				Use		0.76

Factor from Local Co-location Studies

No co-location data was available.

Discussion of Choice of Factor to Use

No opportunity for a co-location study was available so the national adjustment factor was used, which was sourced from the Defra database of national bias adjustment factors [https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html].

QA/QC of Diffusion Tube Monitoring

Data for the laboratory precision of NO2 diffusion tube analysis is provided by Defra https://laqm.defra.gov.uk/diffusion-tubes/precision.html

As advised by Defra, for the purposes of LAQM, laboratory diffusion tube precision is separated into two categories, “Good” and “Poor” as follows: tubes are considered to have

"good" precision where the coefficient of variation (CV) of duplicate or triplicate diffusion tubes for eight or more periods during the year is less than 20%, and the average CV of all monitoring periods is less than 10%. Tubes are considered to have "poor" precision where the CV of four or more periods is greater than 20% and/or the average CV is greater than 10%.

In relation to the summary results that Defra provide the following is advised:

"Please note that the performance of a laboratory may change from one year to another. Therefore, when assessing the performance of a laboratory using the findings [provided in the summary results]*, account should be taken of the proportion of "poor" precision co-location results, not just the presence or absence of poor*

Diffusion Tube Annualisation

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

Diffusion Tube Bias Adjustment Factors

Ceredigion County Council have applied a national bias adjustment factor of 0.76 to the 2022 monitoring data. A summary of bias adjustment factors used by Ceredigion County Council over the past five years is presented in Table C.1.

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	09/23	0.76
2021	National	06/22	0.78
2020	National	06/21	0.76
2019	National	09/20	0.75
2018	National	06/19	0.76
2017	National	09/18	0.77
2016	National	06/17	0.79

NO_2 Fall-off with Distance from the Road

No diffusion tube NO_2 monitoring locations within Ceredigion required distance correction during 2022.

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

Annualisation was not required for 2022 data due to sufficient data capture.

Table E.1 – Impact Matrix

Category	Impact Rating: None	Impact Rating: Small	Impact Rating: Medium	Impact Rating: High
Automatic Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Automatic Monitoring – QA/QC Regime	Adherence to requirements as defined in LAQM.TG16	Routine calibrations taken place frequently but not to normal regime. Audits undertaken alongside service and maintenance programmes	Routine calibrations taken place infrequently and service and maintenance regimes adhered to. No audit achieved	Routine calibrations not undertaken within extended period (e.g. 3 to 4 months). Interruption to service and maintenance regime and no audit achieved
Passive Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Passive Monitoring – Bias Adjustment Factor	Bias adjustment undertaken as normal	<25% impact on normal number of available bias adjustment colocation studies (2020 vs 2019)	25-50% impact on normal number of available bias adjustment studies (2020 vs 2019)	>50% impact on normal number of available bias adjustment studies (2020 vs 2019) and/or applied bias adjustment factor studies not considered representative of local regime
Passive Monitoring – Adherence to Changeover Dates	Defra diffusion tube exposure calendar adhered to	Tubes left out for two exposure periods	Tubes left out for three exposure periods	Tubes left out for more than three exposure periods
Passive Monitoring – Storage of Tubes	Tubes stored in accordance with laboratory guidance and analysed promptly.	Tubes stored for longer than normal but adhering to laboratory guidance	Tubes unable to be stored according to be laboratory guidance but analysed prior to expiry date	Tubes stored for so long that they were unable to be analysed prior to expiry date. Data unable to be used
AQAP – Measure Implementation	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP
AQAP – New AQAP Development	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide