CEREDIGION COUNTY COUNCIL

Report to: Healthier Communities Overview and Scrutiny Committee

Date of meeting: 27/10/2022

Title: A report on the findings of Ceredigion County Council's 2022 Air Quality Progress Report, In fulfilment of Part IV of the Environment Act 1995 Local Air Quality Management.

Purpose of the report: **To brief members on the findings of Ceredigion County Council 2022 Air Quality Progress Report**

Introduction

It is currently estimated that poor air quality contributes to a reduced life expectancy and death, tallying an equivalent of between 1,000 and 1,400 mortalities in Wales each year. The World Health Organisation (WHO) states air pollution as the single largest environmental health risk, globally.

Local authorities have a duty under **Part IV of the Environment Act 1995** to monitor the air quality standards of their area and to report on this annually. Where pollutants are found to exceed statutory limits stipulated in **The Air Quality Standards (Wales) Regulations 2010** the authority must designate a Local Air Quality Management Area (AQMA) in locations of concern. In these areas Air Quality Action Plans (AQAP) must then be introduced and these can include a range of measures extending from traffic management to public information initiatives until the area is brought back into compliance with legal standards.

In Wales, Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10}) are the main two pollutants of concern, with Local Authorities having declared more than 40 AQMAs to date, one for Particulate Matter, the rest associated with Nitrogen Dioxide from road traffic.

Air quality monitoring undertaken in Ceredigion

Statutory monitoring duties

In terms of statutory monitoring duties placed on Ceredigion County Council, there is a requirement to report on both NO_2 and PM_{10} annually. Other pollutants contained in the regulations (namely SO_2, Benzene, 1,3-Butadiene, Carbon Monoxide and Lead) are exempt from mandatory reporting unless there is evidence of a local issue that needs to be addressed.

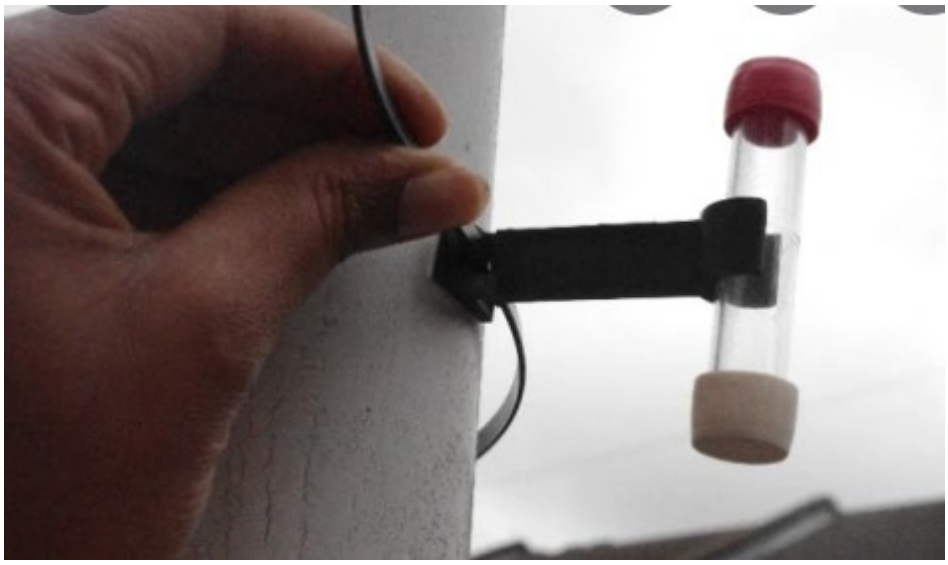
Given Ceredigion's rural location and lack of heavy industries, the authority is not subject to exceedances in relation to the pollutants exempt from mandatory reporting. The Department for Environment, Food and Rural Affairs (DEFRA) use data modelling to produce an Annual National Pollution Climate Map which is used to determine whether a pollutant is reaching legal limits. In the event of an exceedance being noted, this would then trigger the specific monitoring of an implicated pollutant by us as a local authority, however this was not the case in 2021 nor has it been in years prior.

Monitoring of NO_2

Nitrogen dioxide, or NO_2, is a gaseous air pollutant composed of nitrogen and oxygen and is one of a group of related gases called nitrogen oxides, or NOx. NO_2 forms when fossil fuels such as coal, oil, gas or diesel are burned at high temperatures. It is a pollutant heavily

associated with vehicle emissions, particularly from diesel engines. NO_2 has been associated with adverse effects on hospital admissions for various diagnoses, and is known to cause increases in respiratory symptoms, asthma prevalence, cancer incidence, adverse birth outcomes and mortality.

Nitrogen Dioxide concentrations in Ceredigion is monitored by way of Diffusion Tubes which are usually fixed to a lamppost by the roadside. These tubes are collected monthly and sent to an approved laboratory for analysis. After 12 months' worth of data is collected, an average value is established for comparison against statutory limits.



Our current monitoring areas are based in the following locations:

Terrace Road, Aberystwyth
Thespian Street, Aberystwyth
Railway Station, Aberystwyth
Morrisons Roundabout, Aberystwyth
Mill Street, Aberystwyth
High Street, Lampeter
High Street, Cardigan
Quay Street, Cardigan
Pendam
Talybont (New location 2021)
Great Darkgate Street, Aberystwyth (New location 2021)

With the exception of Pendam (which is used as a rural background site for wider reference), these locations were mostly selected on the basis of being "worst case scenario" locations i.e. streets and roads which are subject to highest amounts of traffic congestion. However, locations such as Great Darkgate, along with the two Cardigan locations were selected, in part to observe what potential impact, factors such as one-way systems and seasonally pedestrianised areas would have on localised NO_2 concentrations. Talybont and Great Darkgate Street, Aberystwyth were both sites newly established in 2021.

Monitoring of PM_{10}

Airborne particulate matter (PM) is not a single pollutant, but rather is a mixture of many chemical species. It is a complex mixture of solids and aerosols composed of small droplets of liquid, dry solid fragments, and solid cores with liquid coatings. Particles vary widely in size, shape and chemical composition, and may contain inorganic ions, metallic compounds, elemental carbon, organic compounds, and compounds from the earth's crust. Particles are defined by their diameter for air quality regulatory purposes. Those with a diameter of 10 microns or less (PM_{10}) are inhalable into the lungs and can induce adverse health effects.

Particulate matter can be sourced both naturally and by human activity and occur both indoor and outdoor depending on the source. Sources of PM include the following:

Natural PM biological sources
Burning of fuel in motorized vehicle engines
Industrial processes
Power generators
Burning wood, candles and incense
Stoves, heaters, fireplaces and chimneys
Tobacco smoke

Data from DEFRA is used to monitor PM_{10} concentrations in Ceredigion and this is what is used for the purposes of the Annual Progress report. Similarly, to non-reported pollutants, should this data indicate that the pollutant exceeded statutory limits, this would trigger specific monitoring by Ceredigion at various "worst case scenario" locations.

Ceredigion County Council 2022 Air Quality Progress Report

Ceredigion's Air Quality Progress Report relates to data gathered in the previous year. Therefore the 2022 report relates to air monitoring data collected in 2021.

NO_2 Data 2021

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.78) and Annualised (1)
CERE/21A/NA9S9 (Terrace Road, Aberyswtyth)							16.1	11.2	25.9	23.5	23.4	27.1	21.2	20.4
CERE/21A/NA9S6 (Thespian Street, Aberystwyth)							16.8	18.1	24.8	21.8	20.8	23.9	21.0	20.3
CERE/21A/NA9S10 (Railway Station, Aberystwyth)							18.4	19.9	23.1	19.6	22.4	25.7	21.5	20.7
CERE/21A/NA9S8 (Morrison, Aberystwyth)							18.6	15.8	20.1	16.7	18.7	13.5	17.2	16.6
CERE/21A/NA9S3 (Mill Street, Aberystwyth)							22.0	20.5	24.8	22.8	22.1	25.7	23.0	22.2
CERE/21A/NA9S5 (High Street, Lampeter)							13.2	15.0	16.9	16.6	19.1	20.0	16.8	16.2
CERE/21A/NA9S15 (High Street, Cardigan)							15.3	13.4		16.4	15.9	18.8	16.0	16.6
CERE/21A/NA9S12 (Quay Street, New Quay)							6.5	7.1	9.6	8.1	7.7	12.1	8.5	8.2
CERE/21A/NA9S11 (Pendam)							2.2	1.8	3.5	2.6	1.3	3.5	2.5	2.4
CERE/21A/NA9S7 (Talybont)							24.5	22.2	28.0	25.1	27.5	25.3	25.4	24.5
CERE/21A/NA9S14 (Great Darkgate Street, Aberyswtyth)							10.5	11.1	13.9	15.0	14.0	14.6	13.2	12.7

The statutory limit for NO_2 is an **annual mean of 40µg/m^3**. The NO_2 concentrations noted at all locations of Ceredigion were well below this limit during all months when data was collected. The "Bias Adjusted and Annualised" column outlines Ceredigion's annual average for each location and confirms our legal compliance.

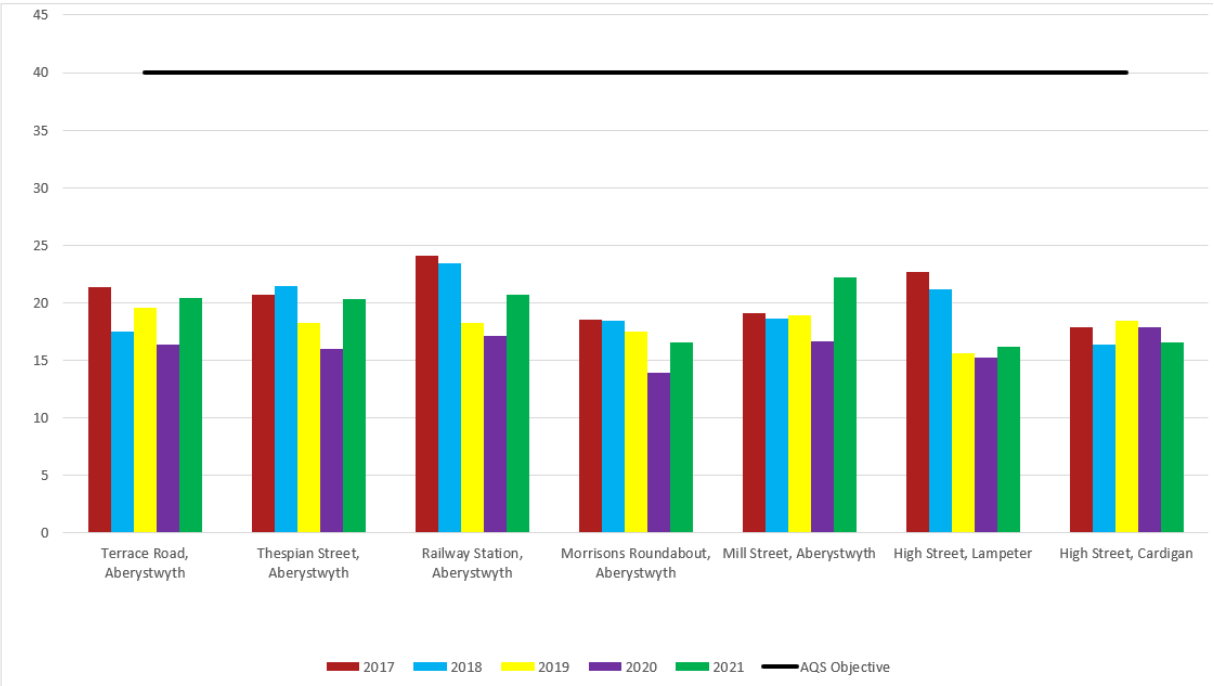
It should be taken into account that only 6 months' worth of data could be collected in 2021 due to lockdown restrictions. This meant an annualization procedure had to be implemented in order to produce average annual values to compare with the legal limit. Annualisation is a process whereby hourly data from the 2 closest national air monitoring stations is inputted into the calculation in order to produce a valid estimate of the true average value for each of our

monitoring sites. Data from Narbeth, Pembrokeshire and Aston Hill, Shropshire monitoring sites was used for our data in 2021. Given the need for annualization during 2021, it is possible that the true annual average NO_2 levels in Ceredigion may slightly differ from what is reported above, however any difference is likely to be negligible, and the true values from each monitoring site would certainly remain within the legal limit.

The new monitoring location of Talybont was found to have the highest annual mean concentration of NO_2 at **24µg/m³**. 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 however the site will be monitored closely in future.

Due to a lack of monthly data from the first 6 months of 2021 there is insufficient data to make valid conclusions regarding the impact of temporary street pedestrianisation and newly formed one-way streets in our towns. It will be the aim of the 2023 Air Progress report to look what impact these changes in localised traffic systems have in locations such as Great Darkgate Street, Aberystwyth along with the two Cardigan monitoring sites.

Trends in Annual Mean NO_2 Concentrations during the last 5 years of monitoring

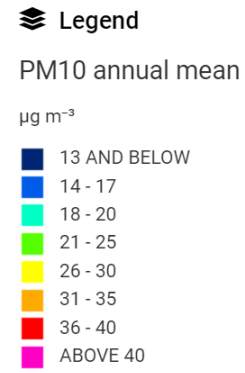


As can be observed in the above graph, annual NO_2 concentrations at most monitoring locations were slightly higher in 2021 than in 2020. The most likely explanation for this is the easing of COVID-19 lockdown restrictions in 2021 leading to increased vehicle emissions on our roads. However, NO_2 concentrations at all locations were still well below an annual mean of **40µg/m³**. The monitoring conducted in 2022 will continue to monitor this annual trend.

PM_{10} Data 2021

The Statutory limit for PM_{10} is an annual mean of 40µg/m^3.

As can be seen in the below data mapped by DEFRA, similarly to the whole of rural Wales, Ceredigion's air was subjected to less than 13µg/m^3 as an annual mean of PM^{10} in 2021 which is less than a third of the statutory limit. This included our busiest town namely, Aberystwyth. Of note is the fact that concentrations only exceeded this average in more built-up industrial areas such as South Wales and Merseyside.



Conclusion

Although NO_2 concentrations were found to be marginally higher in 2021 than in 2020, Ceredigion continues to experience some of the best air quality standards in Wales with all monitoring locations being highly complaint with legal standards. Any increase in NO_2 noted in 2021 comparative to 2020 may be attributed the lifting of lockdown restrictions. It will be the aim of next year's Air Quality Progress report to continue to monitor statutory pollutant levels in the county to ensure continued compliance with legal standards.

Has an integrated impact assessment been completed? If not, please state why		No, there are no proposed changes to current policy or arrangements as a result of the report.
Wellbeing of Future Generations:	***Summary***	
	Long-term:	Public Protection, Air Quality compliance is a statutory duty of the authority and contributes towards the Well-being goals within the Well-being of Future Generations Act (Wales) 2015.
	Collaboration:	Public Protection collaborate with partner agencies including DEFRA and Welsh Government when it comes to Air Quality.
	Involvement:	Public Protection publishes an annual Air Quality Progress Report available to the public.
	Prevention:	Public Protection Air Quality monitoring ensures any exceedances of statutory limits can be quickly identified and addressed.
	Integration:	Public Protection activity is in line with the objectives of health partners and makes a contribution to a number of the Wellbeing goals within the Well-being of Future Generation (Wales) Act 2015.

Recommendation(s):

That the scrutiny committee note the content of the report, and recommend to Cabinet that the report is published on the council website, and submitted to DEFRA, in line with statutory requirements.

Reason(s) for decision: To meet the legal obligations of the authority to monitor air quality, and to publish its findings.

Contact Name:	Heddwyn Evans, Elis Gwyn
Designation:	Environmental Health Manager, Senior Environmental Health Officer
Date of Report:	6th October 2022
Acronyms:	AQMA- Air Quality Management Area AQAP- Air Quality Action Plan

Background Papers:
Ceredigion County Council
2022 Air Quality Progress Report

Corporate Lead Officer:	Alun Williams (Policy, Performance & Public Protection)

Ceredigion County Council

2022 Air Quality Progress Report

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

Date: October 2022

Information	Details
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Report Reference Number	CCC/AQ/2022
Date	05/10/2022

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 2021, 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). This downward trend did not continue in 2021 with Nitrogen Dioxide concentrations being slightly higher than those observed in 2020, however this is likely attributable to the lifting of COVID-19 lockdown measures which were in place in 2020 and the associated increase in road traffic.

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 2021. 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 2021 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

In the summer of 2021, Ceredigion County Council implemented temporary pedestrianised areas in the main tourist towns of Ceredigion, which included Aberystwyth, Aberaeron, New

Quay and Cardigan whereby their high streets were temporarily pedestrianised during busy months subject to high levels of tourism. The temporary pedestrianised areas posed the potential to vary localised air quality due to various streets being relieved of vehicle emissions with other streets potentially being subject to increased emissions due to the formation of one way streets around the pedestrianised areas.

The NO_2 monitoring locations in Quay Street and High street, Cardigan along with a new location established in Great Darkgate Street, Aberystwyth were used in 2021 in order to observe any variance in localised air quality caused by changes to traffic arrangements. The pedestrianisation of Cardigan High Street and Aberystwyth appears not have any significant impact on NO_2 concentrations and levels remained well within statutory limits. However, consideration should be given to the fact that only 6 months' worth of raw data (July-December) could be collected by way of diffusion tubes in 2021, with pedestrianisation not being in effect for the majority of these months. This limited monitoring was due to COVID-19 regulations restrictions during the first half of 2021. Going forward it will be a priority to continue to monitor for Nitrogen dioxide in the county's major towns to ensure valid conclusions as to the impact of pedestrianisation on localised air quality can be drawn.

In 2021 the new monitoring location of Talybont was found to have the highest annual mean concentration of NO_2 at 24µg/m3. 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.

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 September 2020 and was accepted by DEFRA / 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 2021 (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 2021

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 nine locations during 2021. 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

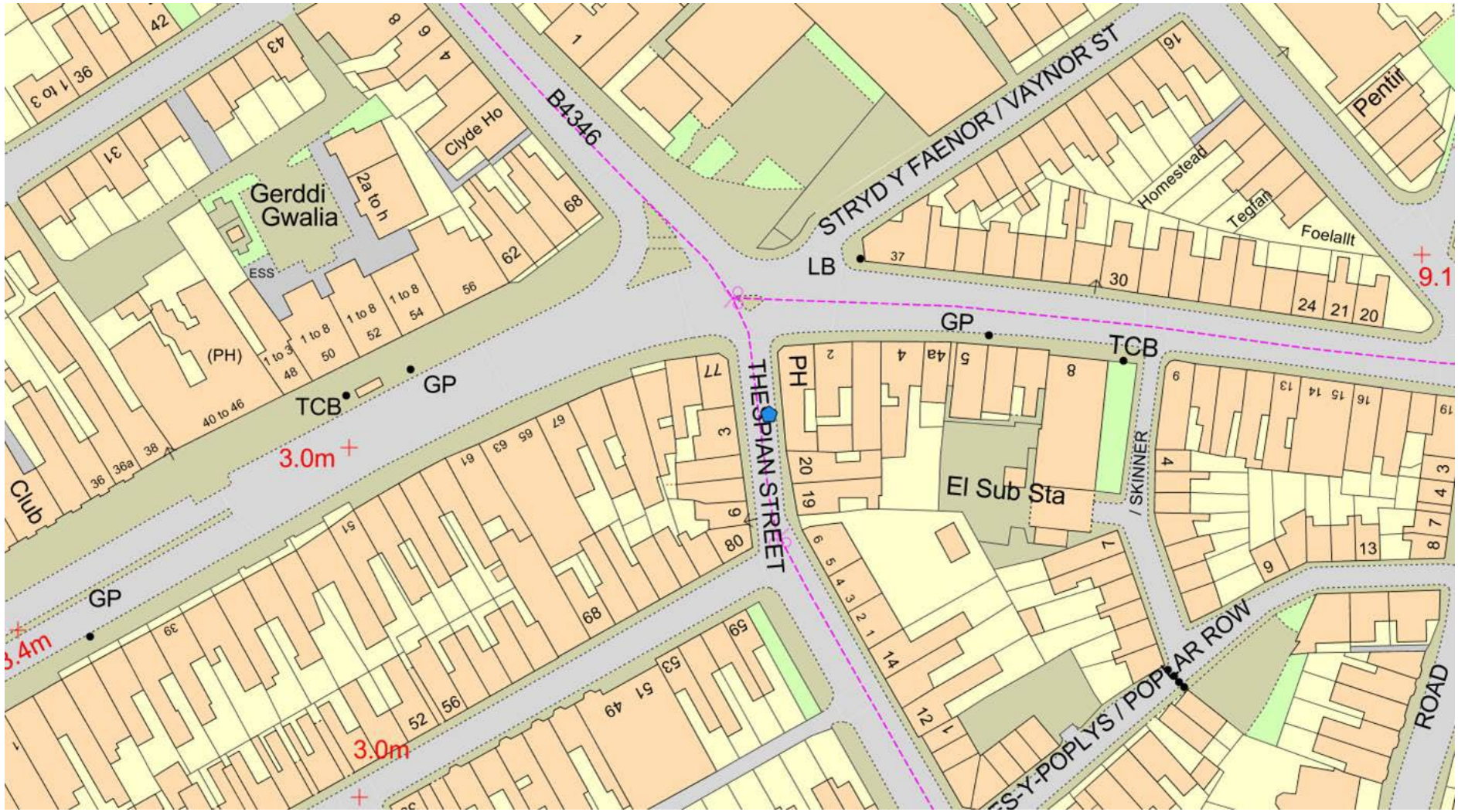
Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Monitor (m)
Great Darkgate Street, Aberystwyth	Urban Centre	N/A	258230	281631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

Notes:

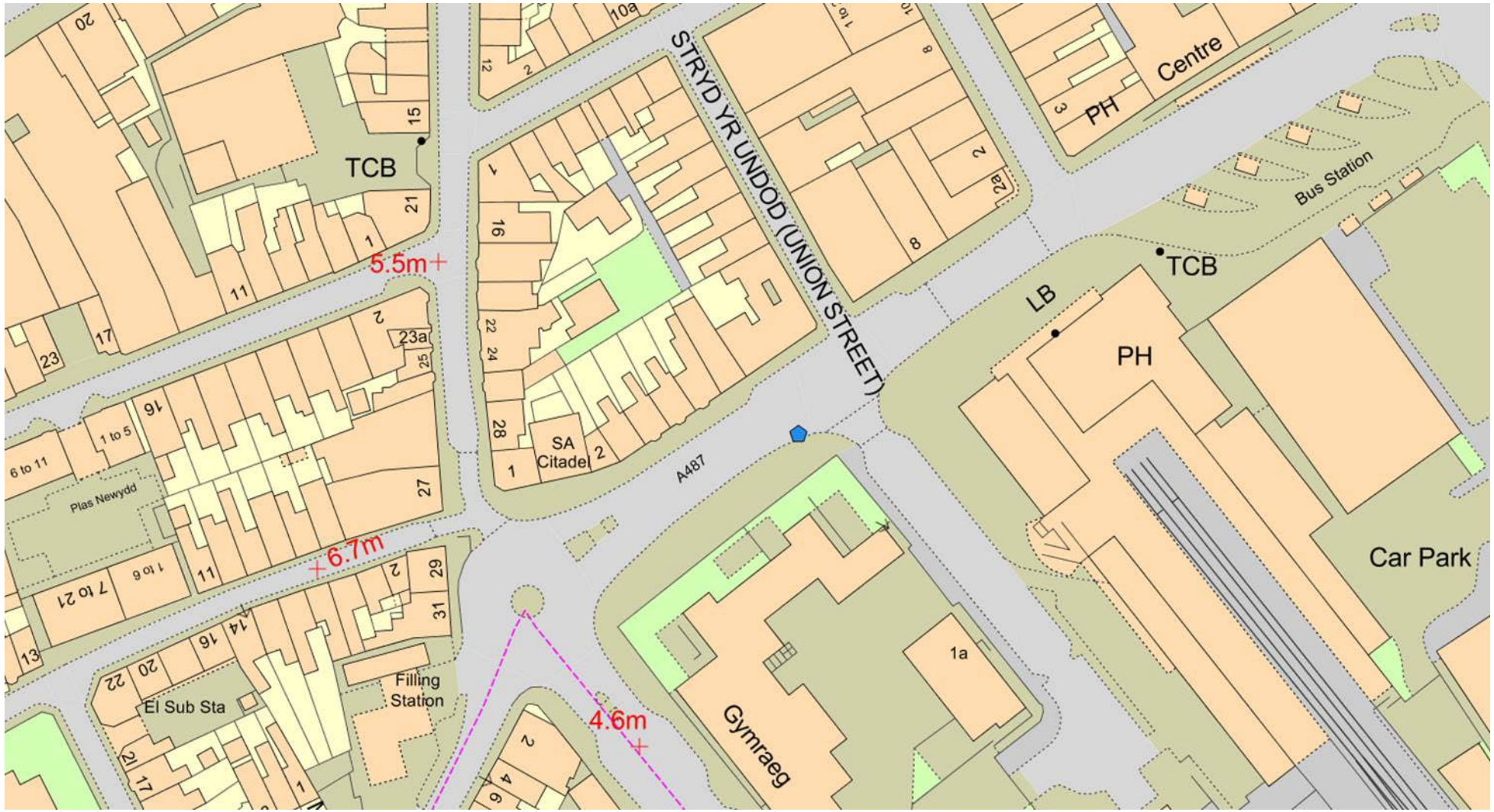
(1) 0m indicates that the sited monitor represents exposure and as such no distance calculation is required.

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

Terrace Road, Aberystwyth

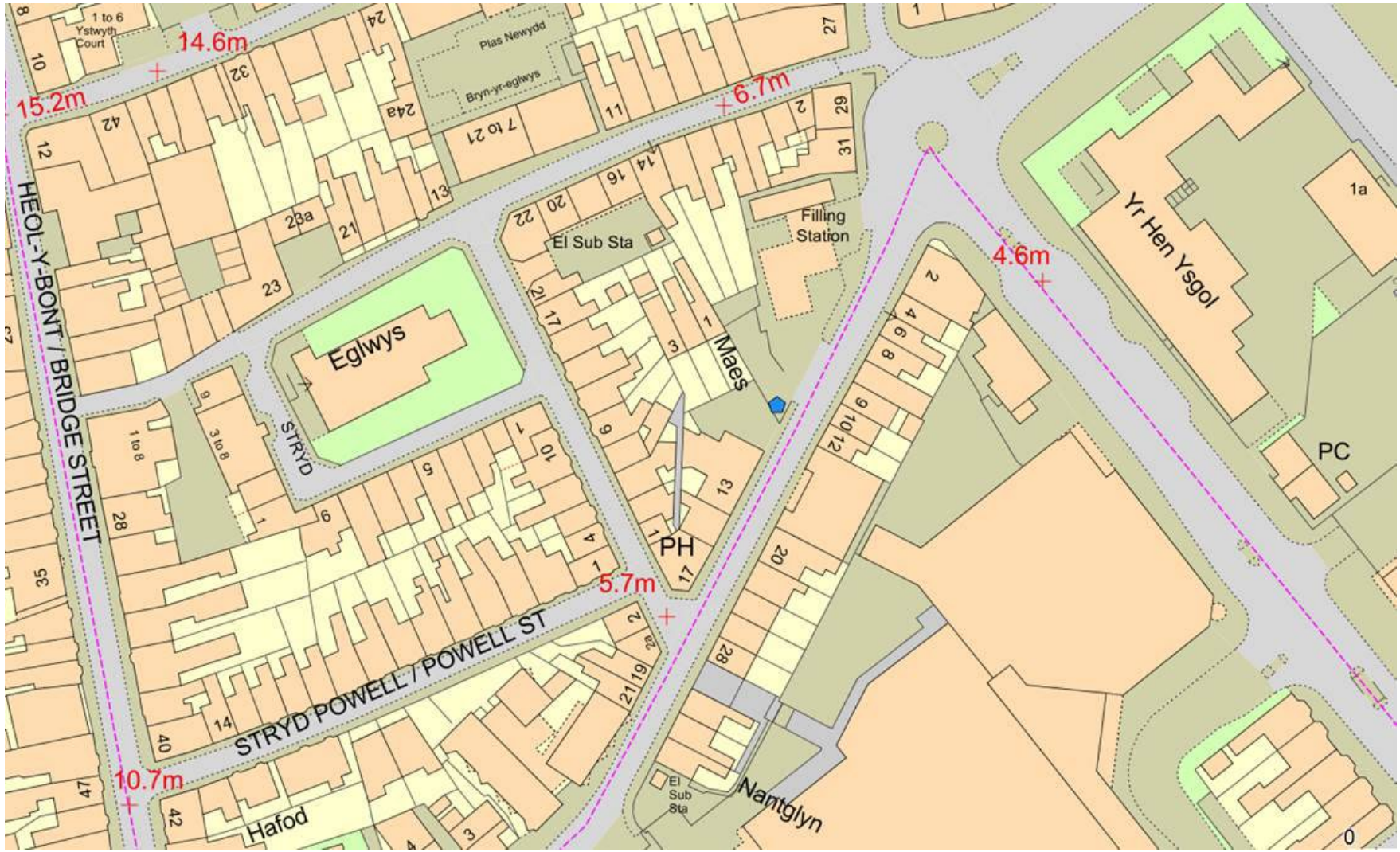


Thespian Street, Aberystwyth

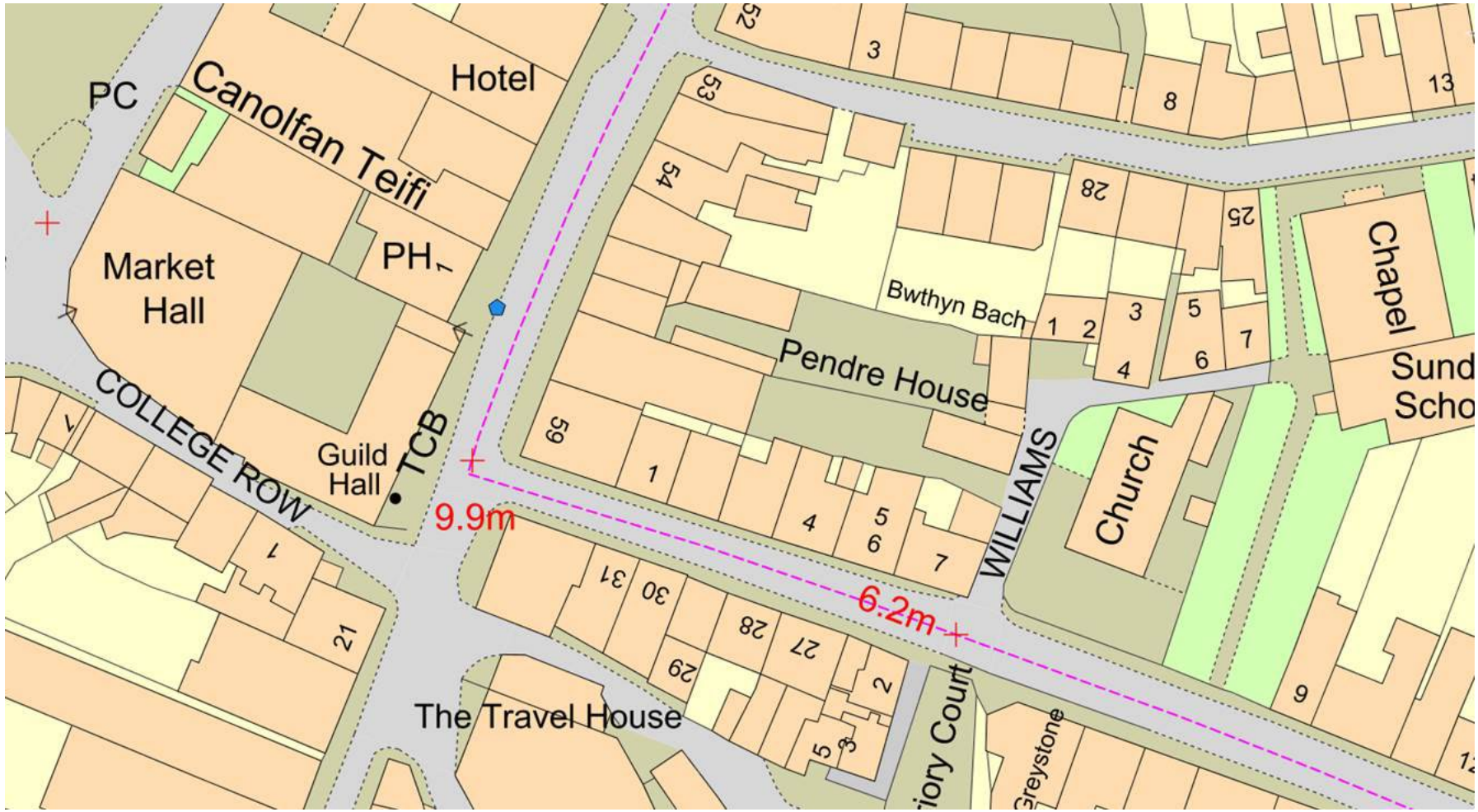


Railway Station, Aberystwyth

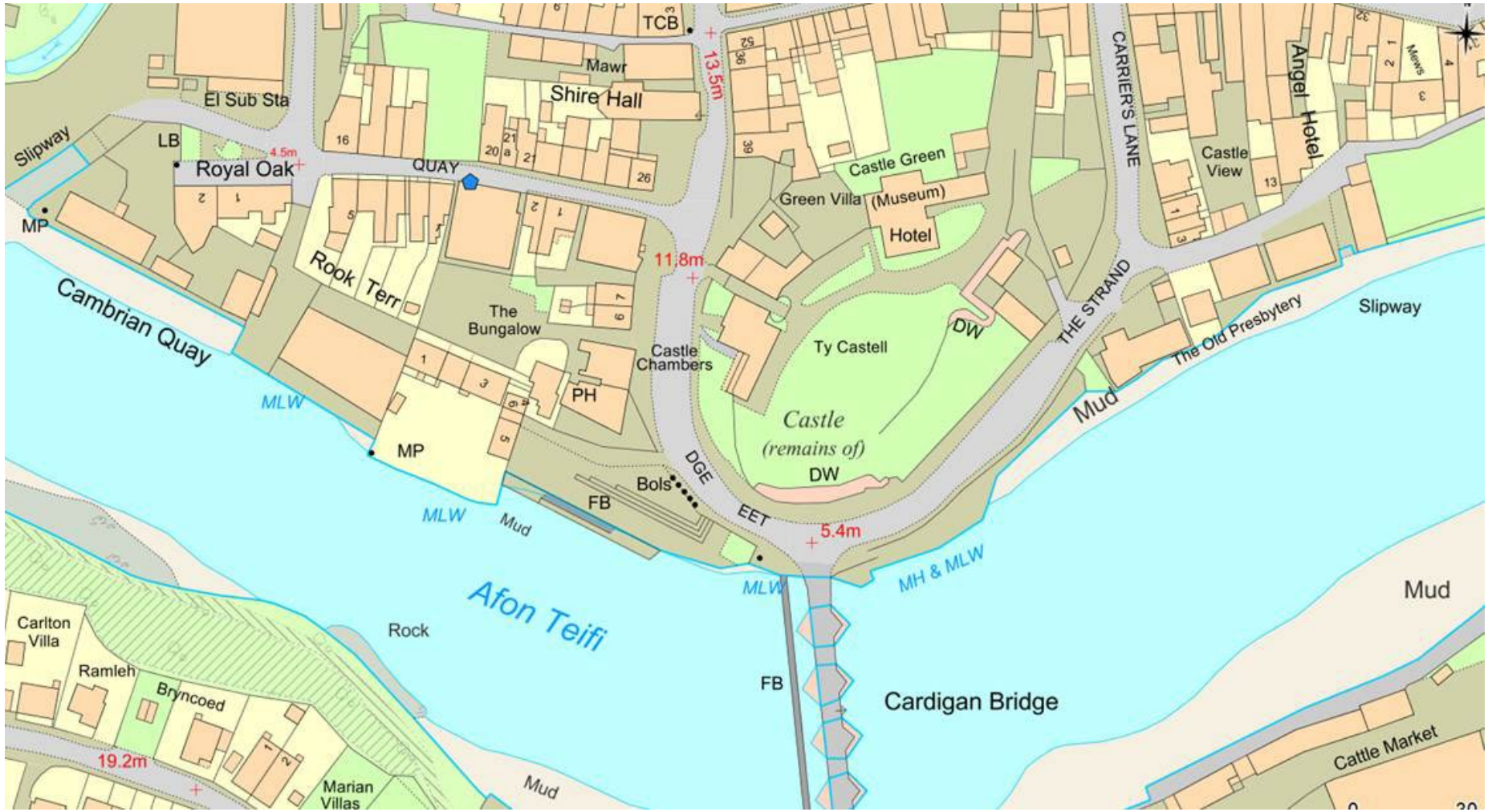
Morrison's Roundabout, Aberystwyth



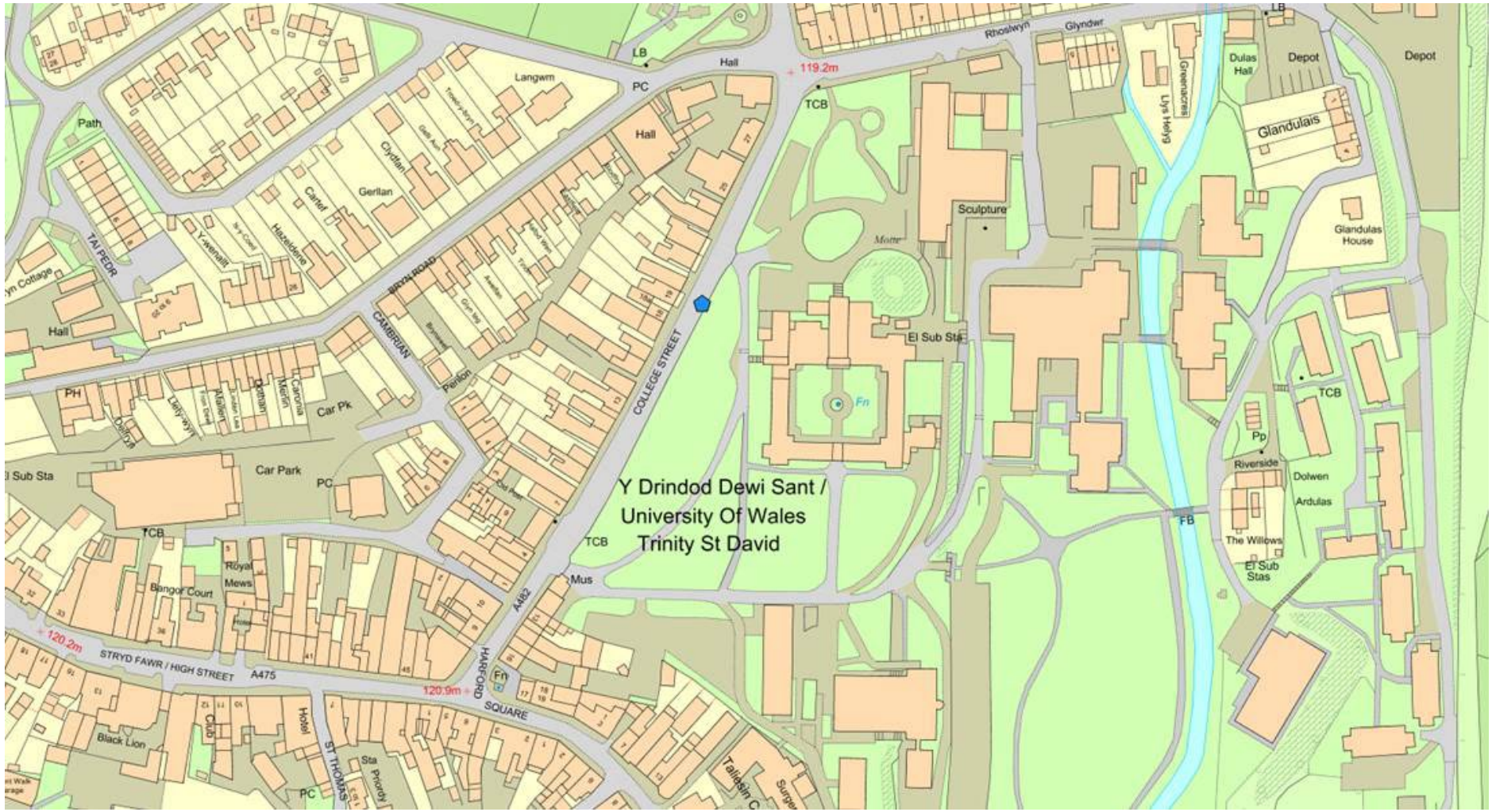
Mill Street, Aberystwyth



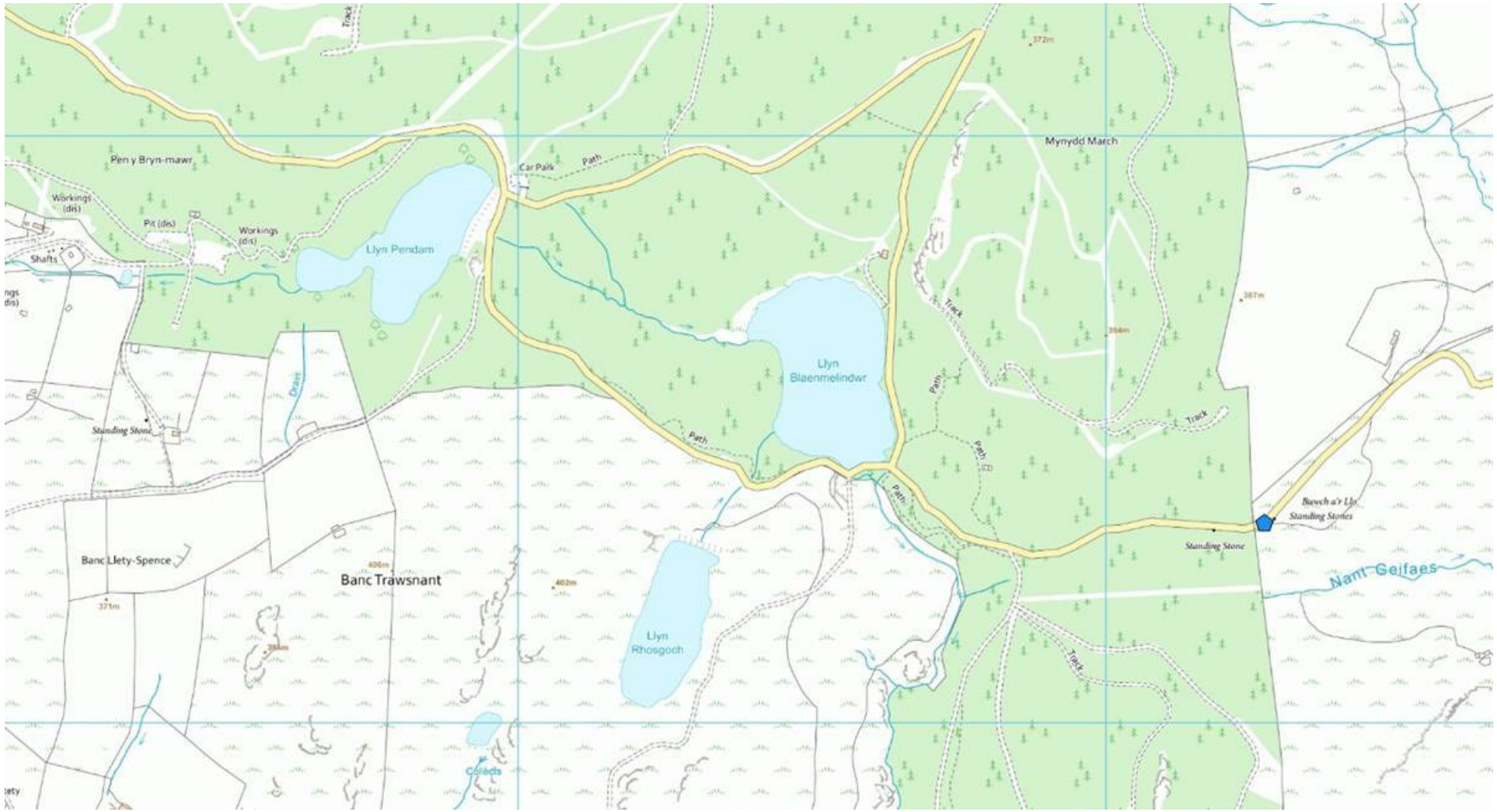
High Street, Cardigan



Quay Street, Cardigan



High Street, Lampeter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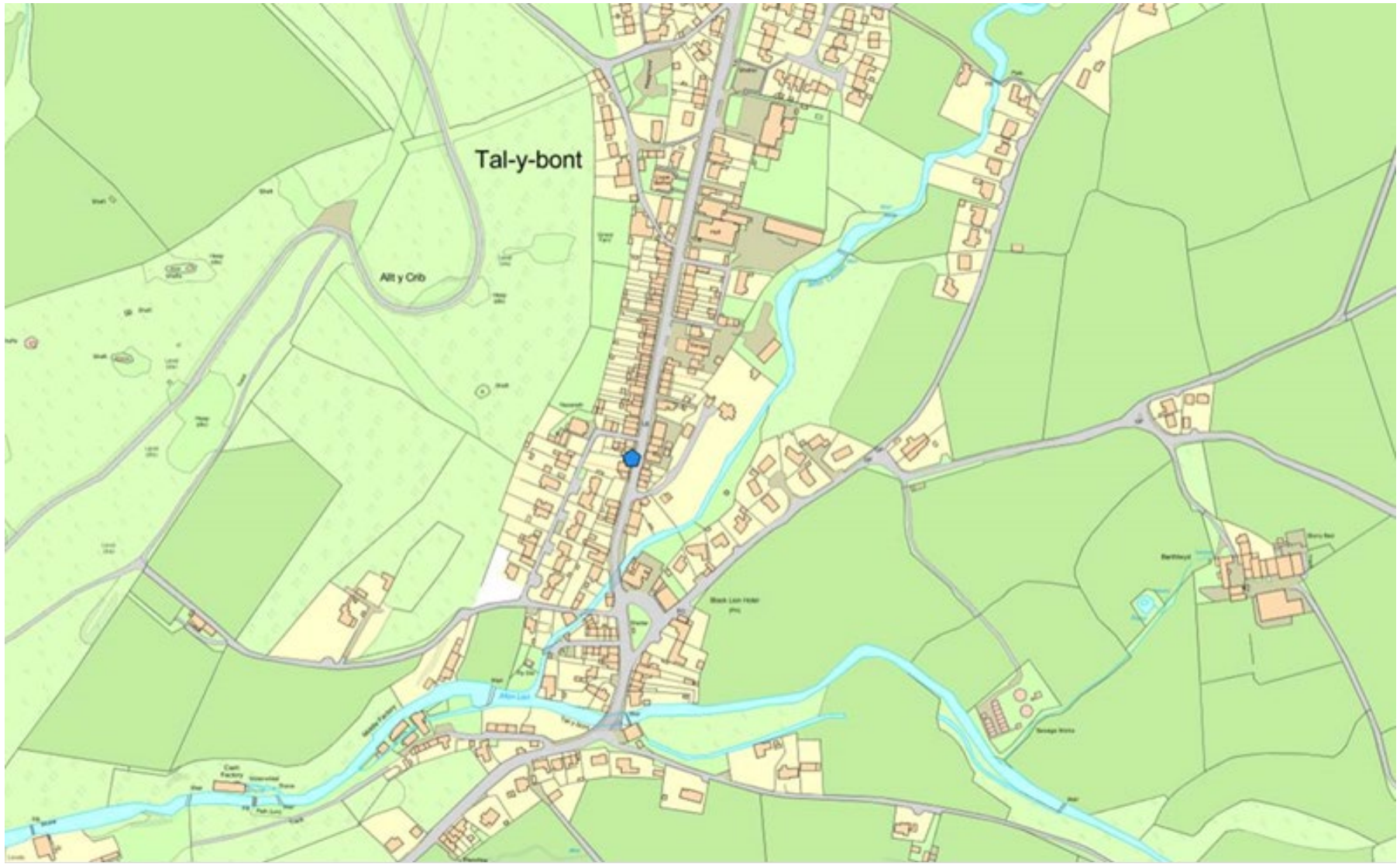


Talybont

Great Darkgate Street, Aberystwyth

2.2 2021 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 2021 (%) (2)	2017	2018	2019	2020	2021
Terrace Road, Aberystwyth	Urban Centre	Diffusion Tube	100	50	21.4	17.5	19.6	16.3	20.4
Thespian Street, Aberystwyth	Urban Centre	Diffusion Tube	100	50	20.7	21.5	18.3	15.8	20.3
Railway Station, Aberystwyth	Urban Centre	Diffusion Tube	100	50	24.1	23.4	18.3	17.0	20.7
Morrisons Roundabout, Aberystwyth	Roadside	Diffusion Tube	100	50	18.5	18.4	17.5	13.8	16.6
Mill Street, Aberystwyth	Urban Centre	Diffusion Tube	100	50	19.1	18.6	18.9	16.5	22.2
High Street, Lampeter	Urban Centre	Diffusion Tube	100	50	22.7	21.2	15.6	15.0	16. 2
Quay Street, Cardigan	Urban Centre	Diffusion Tube	100	50	n/a	n/a	n/a	10.1	8.2
High Street, Cardigan	Urban Centre	Diffusion Tube	83	42	17.9	16.4	18.4	17.7	16.6
Talybont	Roadside	Diffusion Tube	100	50	n/a	n/a	n/a	n/a	24.5
Great Darkgate Street, Aberystwyth	Urban Centre	Diffusion Tube	100	50	n/a	n/a	n/a	n/a	12.7

Notes:

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

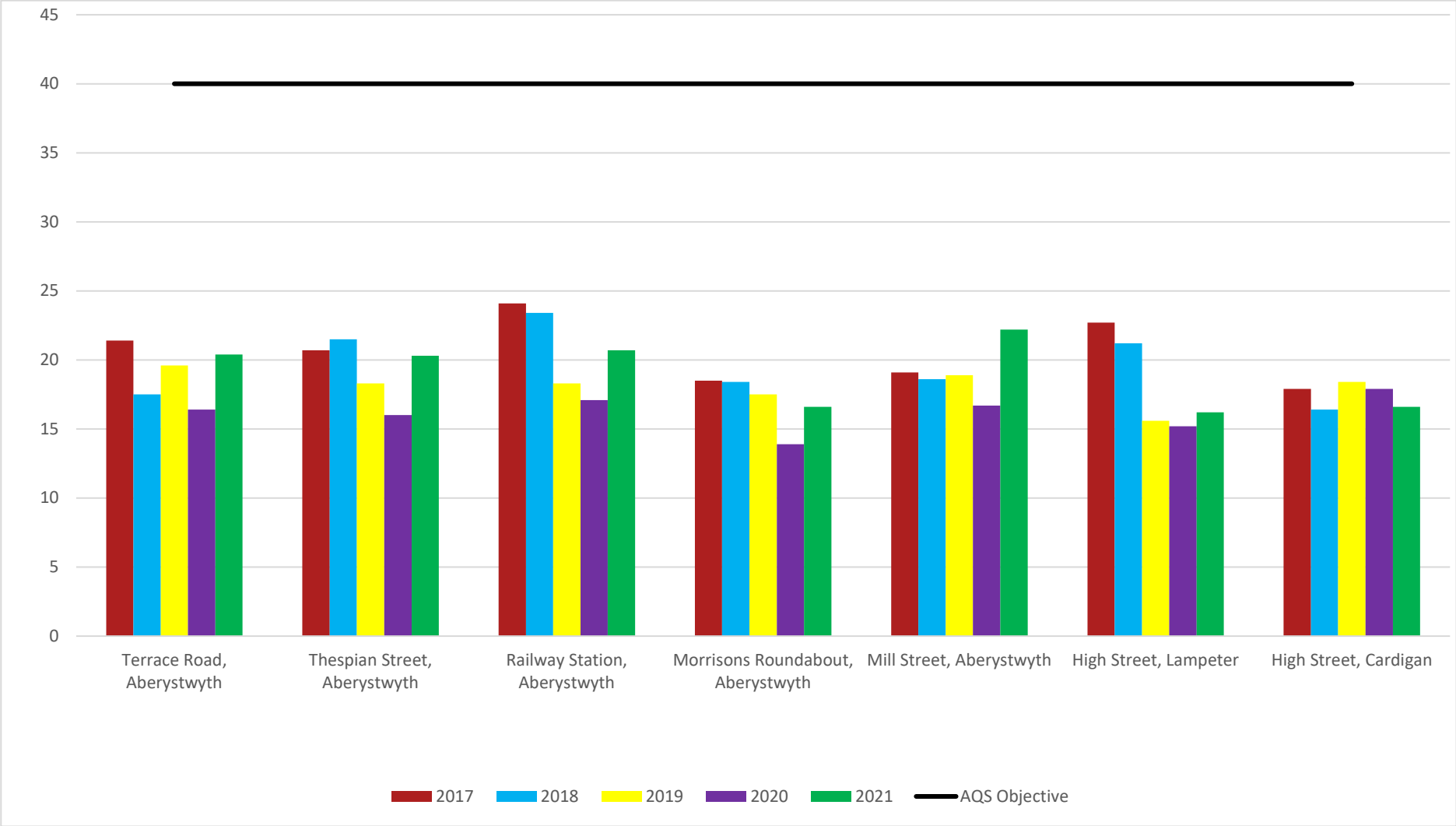
NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

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/m³)



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

During 2021, 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 2021'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 2021'.

2.3.1 Nitrogen Dioxide (NO_2)

Valid data capture was achieved at 50% for all monitoring locations except Cardigan High Street (42% due to one month whereby the diffusion tube was lost). The low data capture meant that an annualisation procedure had to be implemented, a breakdown of which is outlined in Appendix C. 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 2021, 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, the NO_2 annual mean concentrations monitored at all monitoring locations have seen a general steady decrease from 2017 to 2020 without interventions in the form of AQMAs having been implemented. Annual Mean data from 2021 was not consistent with this trend with a slight increase being observed this however this is to be expected due to a national lockdown being in implementation during the majority of 2020 which led to a decrease in vehicle emissions.

The impact of street pedestrianisation on Nitrogen dioxide levels in Cardigan and Aberystwyth could not be fully assessed using 2021 data due limited data being available for periods that street pedestrianisation was in implementation (i.e. summer months). It was noted however that levels at these locations were well within statutory limits. Diffusion tube monitoring will continue at these sites during 2022 in order to gather adequate data to form valid conclusions based on future trends observed and will be reported on in 2022.

The new monitoring location of Talybont was found to have the highest annual mean concentration of NO_2 at **24µg/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 2021. 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 2021

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)

As has been discussed in prior sections of the report, Ceredigion County Council's introduction of temporary street pedestrianisation in the main towns of the county whereby their high streets were temporarily pedestrianised in summer months may lead to improvements in pedestrianised areas of the towns. However a lack of monthly data due to lockdown restrictions meant that no valid conclusions can be drawn based on 2021 data, however their impact will be reported on in the 2023 report.

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 2021, in accordance with the guidance.

3.3 Other Sources

There were no other new sources of significance identified in Ceredigion, in 2021, 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 latest Existing Route Maps and Future Route Maps to the Welsh Government in March 2022 and the Minister for Climate Change approved these on 3 August 2022..

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.

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. The result of the monitoring will be reported on in the 2023 report.

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 2023.

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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 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)
CERE/21A/NA9S9 (Terrace Road, Aberyswtyth)							16.1	11.2	25.9	23.5	23.4	27.1	21.2	20.4	
CERE/21A/NA9S6 (Thespian Street, Aberystwyth)							16.8	18.1	24.8	21.8	20.8	23.9	21.0	20.3	
CERE/21A/NA9S10 (Railway Station, Aberystwyth)							18.4	19.9	23.1	19.6	22.4	25.7	21.5	20.7	
CERE/21A/NA9S8 (Morrison, Aberystwyth)							18.6	15.8	20.1	16.7	18.7	13.5	17.2	16.6	
CERE/21A/NA9S3 (Mill Street, Aberystwyth)							22.0	20.5	24.8	22.8	22.1	25.7	23.0	22.2	
CERE/21A/NA9S5 (High Street, Lampeter)							13.2	15.0	16.9	16.6	19.1	20.0	16.8	16.2	
CERE/21A/NA9S15 (High Street, Cardigan)							15.3	13.4		16.4	15.9	18.8	16.0	16.6	
CERE/21A/NA9S12 (Quay Street, New Quay)							6.5	7.1	9.6	8.1	7.7	12.1	8.5	8.2	
CERE/21A/NA9S11 (Pendam)							2.2	1.8	3.5	2.6	1.3	3.5	2.5	2.4	
CERE/21A/NA9S7 (Talybont)							24.5	22.2	28.0	25.1	27.5	25.3	25.4	24.5	
CERE/21A/NA9S14 (Great Darkgate Street, Aberyswtyth)							10.5	11.1	13.9	15.0	14.0	14.6	13.2	12.7	

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 2021

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 microgrammes per cubic metre $\mu g/m^3$ (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 2021 overall factor of 0.78 (Spreadsheet Version Number: 06/21), which was sourced from the Defra database of national bias adjustment factors [https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html].

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

Annualisation is required for any site with data capture less than 75% but greater than 25%. Annualisation was required for all of Ceredigion County Council's monitoring sites in 2021 due to lockdown restrictions preventing the installation and collection of diffusion tubes for 6 of the 12 months. As part of the annualisation procedure, data gathered from two rural automatic monitoring sites were considered, namely from Narbeth, Pembrokeshire and Aston Hill, Shropshire. Details of the calculation method undertaken is provided in Table C.2.

Diffusion Tube Bias Adjustment Factors

Ceredigion County Council have applied a national bias adjustment factor of 0.78 to the 2021 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
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 2021.

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

Site ID	Annualisation Factor- Narbeth	Annualisation Factor- Aston Hil	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
Terrace Road, Aberystwyth	1.2474	1.2474	1.2363	21.2	26.2
Thespian Street, Aberystwyth	1.2474	1.2251	1.2363	21.0	26.0
Railway Station, Aberystwyth	1.2474	1.2251	1.2363	21.5	26.6
Morrisons Roundabout, Aberystwyth	1.2474	1.2251	1.2363	17.2	21.3
Mill Street, Aberystwyth	1.2474	1.2251	1.2363	23.0	28.4
High Street, Lampeter	1.2474	1.2251	1.2363	16.8	20.8
High Street, Cardigan	1.3877	1.2809	1.3343	16.0	21.3
Quay Street, Cardigan	1.2474	1.2251	1.2363	8.5	10.5
Pendan	1.2474	1.2251	1.2363	2.5	3.1
Talybont	1.2474	1.2251	1.2363	25.4	31.4
Great Darkgate Street, Aberystwyth	1.2474	1.2251	1.2363	13.2	16.3

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