



Pembrokeshire County Council 2023 Annual Progress Report

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Pembrokeshire County Council 2023 Air Quality Progress Report

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

Local Air Quality Management

Date: June, 2023

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Date	June 2023

Executive Summary: Air Quality in Our Area

Air Quality in Pembrokeshire

Pembrokeshire County Council's monitoring network in 2022 reports no exceedances of the NO₂ annual mean AQS (Air Quality Strategy) objective of 40 µg/m³ reported throughout Pembrokeshire. The maximum reported concentration was located at PCC45 of 32.2 µg/m³; this monitoring station is situated along Main Street, located within the Pembroke Air Quality Management Area (AQMA). The remaining monitoring stations reported concentrations well below the AQS objective.

During 2022, 35 passive NO₂ monitoring locations recorded a decrease in annual mean concentrations from 2021, with an average overall decrease of 1.3 µg/m³ across all monitoring sites.

Pembrokeshire County Council currently have two declared AQMAs (Haverfordwest and Pembroke). Details of these AQMAs can be found on the [UKAir](#) website and the [Welsh Government Website](#). All AQMAs have been declared due to exceedances of the NO₂ annual mean AQS objective. All AQMA boundaries are either close to, or have busy roads within them, recognising the influence vehicle emissions have upon local air quality. Both Pembroke and Haverfordwest AQMAs have been compliant for three years.

Concentrations at monitoring location PCC45 have shown to be fluctuating near to 40 µg/m³ over the past five years. Therefore, there is currently no intention to revoke both AQMAs. However, monitoring data will continue to be reviewed at this site over the subsequent years, and in the event of continual decreases, further assessment will be completed into revocation. If monitored decreases are reported at PCC45, Pembrokeshire may look to initiate the revocation process of Haverfordwest AQMA.

No diffusion tube monitoring sites reported an annual mean NO₂ concentration greater than 60 µg/m³, therefore in accordance with LAQM.TG(22) it is not believed that there have been any exceedances of the 1-hour NO₂ AQS objective in these areas. Additionally, the automatic monitoring station located in Narberth (PEMB) reported no 1-hour NO₂ concentrations greater than 200 µg/m³.

The Narberth automatic monitoring station reports PM₁₀ and PM_{2.5} compliance, with both the annual and 24-hour AQS objectives continuing to be maintained.

Actions to Improve Air Quality

Pembrokeshire County Council continue to have two AQMA's declared for exceedances of the NO₂ annual mean AQS objective. An Action Plan has been developed to assist with the control and management of air quality, with the main focus on reducing annual mean NO₂ concentrations. The Council continues to review the monitoring network in order to deploy new monitoring sites where it is expected that there may either be exceedances or in areas where congestion occurs.

Local Priorities and Challenges

Pembrokeshire County Council continues to monitor NO₂ concentrations throughout the County, and in particular within the two AQMAs. The Council intends to revoke the AQMAs once annual mean NO₂ concentrations have remained below 36 µg/m³ for three consecutive years in order to ensure that compliance is maintained. Concentrations in previous years have been observed to be increased at some locations in the Pembroke AQMA, if this continues in future years then an investigation will be undertaken to determine the cause of this. The Council also intends to continue progressing with air quality measures stated in their action plan to improve air quality within the County and wider area.

How to Get Involved

Specific information on Air Quality in Pembrokeshire can be accessed via Pembrokeshire County Council's website. The Welsh Air Quality website details all Welsh automatic air quality monitoring data with information and links to other sources of air quality data, including educational resources for schools. [UK-AIR](#) provides information on the national UK air quality information.

Table of Contents

Executive Summary: Air Quality in Our Area	i
Air Quality in Pembrokeshire	i
Actions to Improve Air Quality	ii
Local Priorities and Challenges	ii
How to Get Involved	ii
1 Actions to Improve Air Quality	1
Previous Work in Relation to Air Quality	1
Air Quality Management Areas	1
Implementation of Action Plans	3
2 Air Quality Monitoring Data and Comparison with Air Quality Objectives	8
Summary of Monitoring Undertaken in 2022.....	8
2.1.1 Automatic Monitoring Sites	8
2.1.2 Non-Automating Monitoring Sites	8
2022 Air Quality Monitoring Results.....	21
Comparison of 2022 Monitoring Results with Previous Years and the Air Quality Objectives	33
2.1.3 Nitrogen Dioxide (NO ₂)	33
2.1.4 Particulate Matter (PM ₁₀)	33
2.1.5 Particulate Matter (PM _{2.5}).....	34
2.1.6 Other Pollutants Monitored Ozone	34
2.1.7 Sulphur Dioxide (SO ₂).....	34
Summary of Compliance with AQS Objectives as of 2022.....	34
3 New Local Developments	35
Road Traffic Sources (and Other Transport).....	36
Industrial / Fugitive or Uncontrolled Sources / Commercial Sources.....	36
Other Sources	36
4 Policies and Strategies Affecting Airborne Pollution	37
Local / Regional Air Quality Strategy	37
Air Quality Planning Policies.....	38
Local Transport Plans and Strategies.....	39
Active Travel Plans and Strategies	40
Local Authorities Well-being Objectives.....	40
Green Infrastructure Plans and Strategies.....	40
Climate Change Strategies.....	40
5 Conclusion and Proposed Actions	41
Conclusions from New Monitoring Data.....	41
Conclusions relating to New Local Developments	41
Other Conclusions.....	41

Proposed Actions	42
References	43
Appendices	44
Appendix A: Quality Assurance / Quality Control (QA/QC) Data.....	45
Appendix B: A Summary of Local Air Quality Management	47
Purpose of an Annual Progress Report	47
Air Quality Objectives	47
Appendix C: Air Quality Monitoring Data QA/QC.....	49
QA/QC of Diffusion Tube Monitoring	49
Diffusion Tube Annualisation	49
Diffusion Tube Bias Adjustment Factors	50
NO ₂ Fall-off with Distance from the Road.....	51
QA/QC of Automatic Monitoring	51
PM ₁₀ and PM _{2.5} Monitoring Adjustment	51
Automatic Monitoring Annualisation	51
NO ₂ Fall-off with Distance from the Road.....	51
Appendix D: AQMA Boundary Maps.....	52
Glossary of Terms	54

Tables

Table 1.1 – Declared Air Quality Management Areas	2
Table 1.2 – Progress on Measures to Improve Air Quality.....	4
Table 2.1 – Details of Automatic Monitoring Sites	9
Table 2.2 – Details of Non-Automatic Monitoring Sites.....	11
Table 2.3 – Annual Mean NO ₂ Monitoring Results (µg/m ³).....	21
Table 2.4 – 1-Hour Mean NO ₂ Monitoring Results, Number of 1-Hour Means > 200µg/m ³	27
Table 2.5 - Annual Mean PM ₁₀ Monitoring Results (µg/m ³)	28
Table 2.6 – 24-Hour Mean PM ₁₀ Monitoring Results, Number of PM ₁₀ 24-Hour Means > 50µg/m ³	30
Table 2.7 – PM _{2.5} Monitoring Results (µg/m ³).....	31
Table A.1 – Full Monthly Diffusion Tube Results for 2022 (µg/m ³)	45
Table B.1 – Air Quality Objectives Included in Regulations for the Purpose of LAQM in Wales.....	48
Table C.1 – Annualisation Summary (concentrations presented in µg/m ³).....	50
Table C.2 – Bias Adjustment Factor	51

Figures

Figure 2.1 – Map(s) of Automatic Monitoring Sites	10
Figure 2.2 – Maps of Non-Automatic Monitoring Site in Haverfordwest.....	15
Figure 2.3 – Map of Non-Automatic Monitoring Sites in Pembroke	18
Figure 2.4 – Map of Non-Automatic Monitoring Sites in Narberth.....	19
Figure 2.5 – Spatial Map of Pembrokeshire's Automatic and Non-Automatic Monitoring Network.....	20
Figure 2.6 – Trends in Annual Mean NO ₂ Concentrations at Narberth	23
Figure 2.7 – Trends in Annual Mean NO ₂ Concentrations in Haverfordwest	24
Figure 2.8 – Trends in Annual Mean NO ₂ Concentrations in Haverfordwest	25
Figure 2.9 – Trends in Annual Mean NO ₂ Concentrations in Haverfordwest and Narberth	26
Figure 2.10 – Trends in Annual Mean PM ₁₀ Concentrations at Narberth.....	29
Figure 2.11 – Trends in Annual Mean PM _{2.5} Concentrations at Narberth	32
Figure C.1 – Diffusion Tube Bias Adjustment Factors Spreadsheet	50
Figure D.1 – Map of the Haverfordwest AQMA Boundary	52
Figure D.2 – Map of the Pembroke AQMA Boundary	53

1 Actions to Improve Air Quality

Previous Work in Relation to Air Quality

A summary of the reports produced on air quality by Pembrokeshire County Council to date are accessible on the Pembrokeshire County Council [website](#), via previous Annual Status Reports (APR), which summarise previous year air quality reports.

Annual Progress Report 2022 Summary

2022 The monitoring network within Pembrokeshire reported an overall increase in NO₂ concentrations, with 44 out of 45 non automatic sites undergoing and increase from 2020. This increase is most likely attributed to the impacts of the COVID-19 pandemic in 2020, whereby the Welsh Government enforced lockdowns and advised home working where possible. As such, traffic levels decreased, as did NO₂ concentrations, 2021 did not experience a near full year of government lockdown, therefore was subject to increased levels of traffic volume from 2020, therefore reflecting pre-pandemic traffic volumes. Despite this, both Haverfordwest and Pembroke AQMAs continue to report compliance, with Haverfordwest reporting five year compliance and Pembroke three year full compliance. Concentrations at monitoring location PCC45 have shown consistently high levels of NO₂ over the past five years, therefore, there is currently no intention to revoke Pembrokeshire's AQMAs.

Air Quality Management Areas

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

A summary of AQMAs declared by Pembrokeshire County Council can be found in Table 1.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online on the [Council's website](#) and [UK-Air](#).

Table 1.1 – Declared Air Quality Management Areas

AQMA	Relevant Air Quality Objective(s)	Comments on Air Quality Trend	City / Town	Description	Action Plan
Haverford – West	NO ₂ annual mean	There has been noticeable improvement in air quality in the AQMA for several years, with the last reported exceedance being in 2016 (40.3 µg/m ³). Some locations have had increasing NO ₂ concentrations over the past 5 years, but still compliant. A large decrease at all sites has been observed in 2020.	Haverfordwest	The main road network through the town comprising mixed commercial residential areas.	Action Plan 2014 Updated 2019
Pembroke	NO ₂ annual mean	There has been overall improvement in air quality in the AQMA for several years, with the last exceedance being in 2018 (41.2 µg/m ³). Most sites are well below the AQS objective, however one (PCC45) has remained between 36-40 µg/m ³ . A large decrease at all sites has been observed in 2020.	Pembroke	Part of the main road network through the town, the main shopping high street with a mix of commercial and residential property.	Action Plan 2014 Updated 2019

AQMA boundary maps within Pembrokeshire County Council can be viewed in Appendix D.

Implementation of Action Plans

Pembrokeshire County Council has taken forward a number of measures during 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 1.2. More detail on these measures can be found in the Air Quality Action Plan relating to any designated AQMAs.

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

Table 1.2 – Progress on Measures to Improve Air Quality

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
1	Air Quality Action Plan 2017	Parking Restrictions Pembroke AQMA	County Council	2014	Updated 2019	NO ₂ Levels	Compliance e with NO ₂ objective in AQMA	Reduction of NO ₂ levels but cannot patrol 7 days a week	Compliance with NO ₂ objective achieved but <36ug/m ³ required for three consecutive years	Ongoing	Reduction of initial exceedances that led to AQMA declaration
2	LINC	Bwcabus service	Partnership Carmarthenshire, Ceredigion, Pembrokes hire Authority's	Pre 2017	2017 to 2020 RDP	None	n/a	Used by public in other areas	n/a	Ongoing	Remove private vehicles from roads
3	Active Travel Consultation	Walking and cycling	County Council	2017 public consultation	2017	None	n/a	Ongoing	n/a	15 year programme	To ensure planners consider needs of walkers and cyclists and encourage active travel
4	Chimney Links, Fishguard	To alleviate traffic congestion and improve public transport in town centre	County Council	Pre 2017	2017	n/a	n/a	Completed	Completed, traffic diverted from narrow street areas reducing congestion	Completed	Alleviate vehicle congestion and associated emissions within town centre

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
5	Quality Partnership Scheme	Improve the quality and service provided by bus operators	Welsh Government	Pre 2017	2017	n/a	Contributes to reduced emissions	Funding received	n/a	Ongoing	Encourage use of public transport reducing private vehicle use
6	Review of Local Development Plan	Statutory requirement	County Council	2017	2019	n/a	Air quality considerations within planning consultation phase	Public Consultation	Ongoing, extended delivery agreement due to COVID-19	2022	Relevant departments can comment in relation to developments and air quality Specifically.
7	Enforcement Actions	Statutory requirement	Local Authority	Statutory obligation	Statutory obligation	Increase in enforcement action implemented	To mitigate emissions from burning trade wastes	Ongoing	High profile local businesses burning trade wastes. Persons/businesses contacted via informative letters detailing relevant legislation and enforcement actions.	Ongoing	Protection of public health and the environment
8	Funding Boost	Transport Schemes	Welsh Government	Pre 2018	2018	n/a	n/a	n/a	n/a	Ongoing	Develop cycle/pedestrian routes, electric car charging facilities, transport data studies to deliver sustainable transport initiatives

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
9	Pedestrianisation Scheme Consultation	To remove annual variation to start finish dates in Tenby	Local Authority	Pre 2018	2018	n/a	n/a	Ongoing strategy	Ongoing annual scheme	Ongoing	Questionnaire e to assess public interest in development and possible permanent pedestrianisation of Tenby Centre
10	Website Development	Maps and detailed information of cycle routes around county to website	Local Authority	Pre 2018	2018	n/a	n/a	Ongoing	Ongoing	Ongoing	Information source for cyclists includes traffic free sections of cycle path routes
11	Coastal Bus Service Provision	To provide access for tourists, walkers, and residents in coastal communities	Local Authority and Pembrokes hire Coast National Park	Pre 2015	Pre 2015	Increase in passenger figures	n/a	Ongoing	n/a	Ongoing	Remove private vehicles from road use
12	Vehicle Idling Prevention	To prevent emissions to air from idling vehicles	Local Authority	Pre 2018	2018	Taxi rank in AQMA well within NO ₂ objective	Yes	Ongoing	Annual Mean Objective for NO ₂ met	Ongoing	Taxi firms contacted directly via Licensing regime, Annual Mean NO ₂ Objective met
13	Greening Pembroke Town Centre	To mitigate air borne pollution and protect public health	Local Authority	2019	2020	n/a	Yes	Application stage	n/a for return	n/a	n/a

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
14	Greening Haverfordwest Town Centre	To mitigate air borne pollution and protect public health	Local Authority	2019	2020	n/a	Yes	Application stage	n/a	n/a	n/a
15	Carbon Neutral Pembrokeshire	Combat Climate Change	Local Authority	2019	Carbon Neutral by 2030 survey	Cardiff University and Coastal Communities Adapting Together charged with project	Possible	Questionnaire provided	Collation of responses has not yet taken place	n/a	Joint benefits of CO ₂ and NO ₂ , many measures to reduce CO ₂ focus on changing mode of transport

2 Air Quality Monitoring Data and Comparison with Air Quality Objectives

Summary of Monitoring Undertaken in 2022

2.1.1 Automatic Monitoring Sites

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

Pembrokeshire County Council undertook automatic (continuous) monitoring at one site during 2022. Table 2.1 presents the details of the site. National monitoring results are available at both the [Welsh Air Quality Forum](#) and [UK-AIR](#). This monitoring site is part of, and managed by, the [Automatic Urban and Rural Network](#) (AURN).

Maps showing the location of the monitoring sites are provided in Figure 2.1 and on the [Welsh Air Quality Forum](#). Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C: Air Quality Monitoring Data QA/QC.

2.1.2 Non-Automating Monitoring Sites

Pembrokeshire County Council undertook non-automatic (passive) monitoring of NO₂ at 45 sites during 2022. Table 2.2 presents the details of the sites.

Maps showing the location of the monitoring sites are provided in Figure 2.2 – Figure 2.4. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

Table 2.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	Associated with (Named) AQMA?	X OS Grid Reference	Y OS Grid Reference	Pollutants Monitored	Monitoring Technique	Inlet Height (m)	Distance from monitor to nearest relevant exposure (m) ⁽¹⁾	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
PEMB	Narberth	Rural	N/A	214374	212774	NO ₂ , O ₃ , PM ₁₀ , PM _{2.5} , SO ₂	API Analysers, Fidas, Echotech Serinus	2.5	N/A	N/A	N/A

Notes:

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

Figure 2.1 – Map(s) of Automatic Monitoring Sites

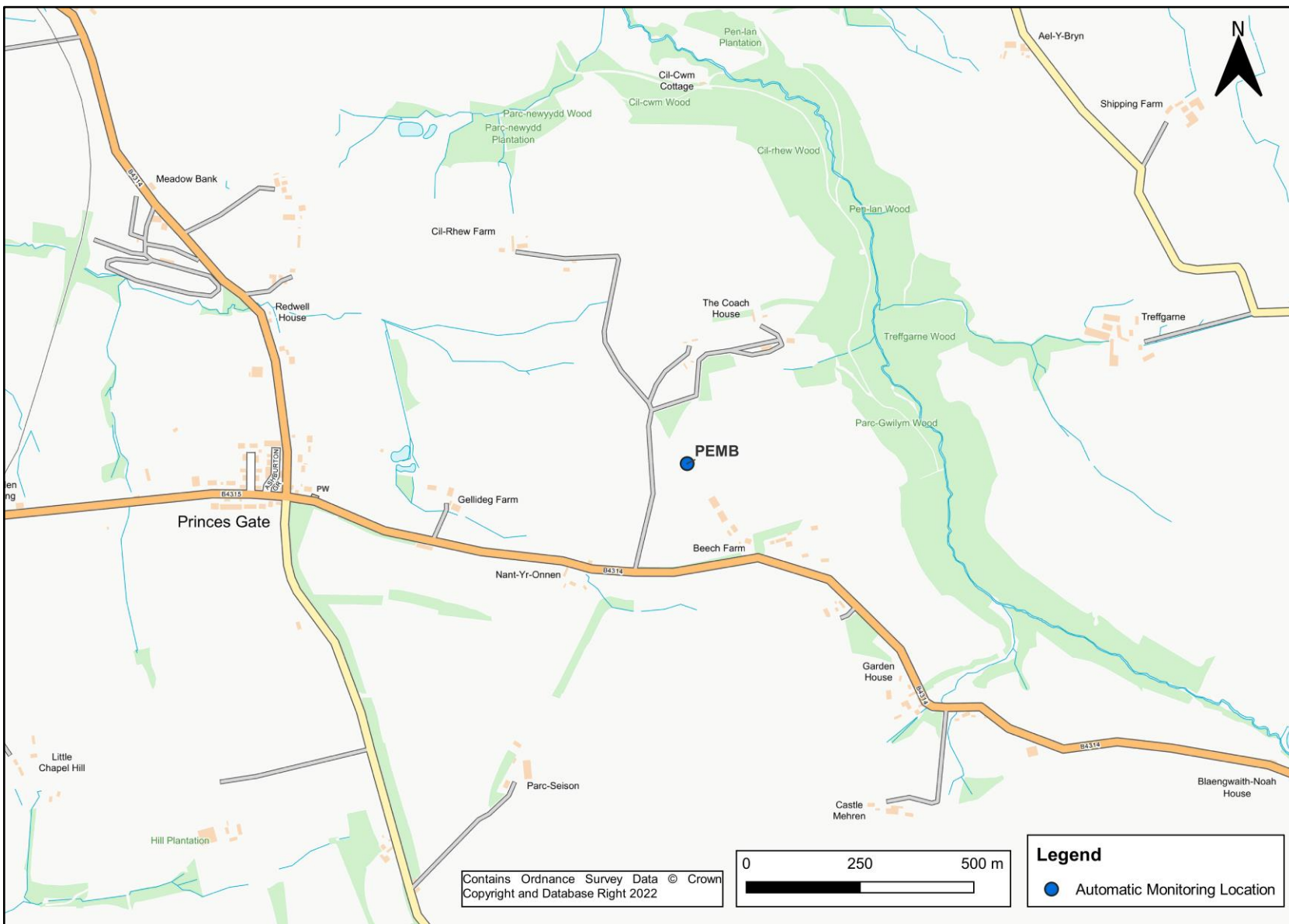


Table 2.2 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) ⁽¹⁾	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
PCC1	Salutation Square	Roadside	N	195629	215655	2.0	N	N/A	N/A	1.0
PCC2	Picton Place	Roadside	Y - Haverfordwest AQMA	195574	215704	2.0	N	1.0	2.0	1.0
PCC3	Victoria Place	Roadside	Y - Haverfordwest AQMA	195474	215661	2.0	N	1.0	2.0	1.0
PCC4	High St	Roadside	Y - Haverfordwest AQMA	195402	215634	2.0	N	1.0	2.0	1.0
PCC5	High St	Roadside	Y - Haverfordwest AQMA	195312	215605	2.0	N	1.0	2.0	1.0
PCC6	High St	Roadside	Y - Haverfordwest AQMA	195294	215591	2.0	N	1.0	2.0	1.0
PCC7	High St	Roadside	Y - Haverfordwest AQMA	195203	215544	2.0	N	1.0	2.0	1.0
PCC8	High St	Roadside	Y - Haverfordwest AQMA	195159	215494	2.0	N	1.0	2.0	1.0
PCC9	Dark St	Roadside	N	195267	215603	2.0	N	1.0	2.0	1.0
PCC10	Dark St	Roadside	N	195177	215616	2.0	N	1.0	2.0	1.0
PCC11	Dew St	Roadside	Y - Haverfordwest AQMA	195143	215464	2.0	N	1.0	2.0	1.0
PCC12	Dew St	Roadside	Y - Haverfordwest AQMA	195110	215394	2.0	N	1.0	2.0	1.0

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) ⁽¹⁾	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
PCC13	Dew St	Roadside	Y - Haverfordwest AQMA	195101	215357	2.0	N	1.0	2.0	1.0
PCC14	Dew St	Roadside	Y - Haverfordwest AQMA	195028	215269	2.0	N	1.0	2.0	1.0
PCC15	Dew St	Roadside	Y - Haverfordwest AQMA	194998	215255	2.0	N	1.0	2.0	1.0
PCC16	Shipmans Lane	Roadside	N	195006	215208	2.0	N	1.0	2.0	1.0
PCC17	Albert St	Roadside	Y - Haverfordwest AQMA	194945	215259	2.0	N	0.0	1.0	1.0
PCC18	Albert St	Roadside	Y - Haverfordwest AQMA	194937	215254	2.0	N	0.0	1.0	1.0
PCC19	Albert St	Roadside	Y - Haverfordwest AQMA	194936	215268	2.0	N	0.0	1.0	1.0
PCC20	Albert St	Roadside	Y - Haverfordwest AQMA	194922	215263	2.0	N	0.0	1.0	1.0
PCC21	Albert St	Roadside	Y - Haverfordwest AQMA	194930	215276	2.0	N	0.0	1.0	1.0
PCC22	Albert St	Roadside	Y - Haverfordwest AQMA	194911	215268	2.0	N	0.0	1.0	1.0
PCC23	Albert St	Roadside	Y - Haverfordwest AQMA	194911	215279	2.0	N	0.0	1.0	1.0

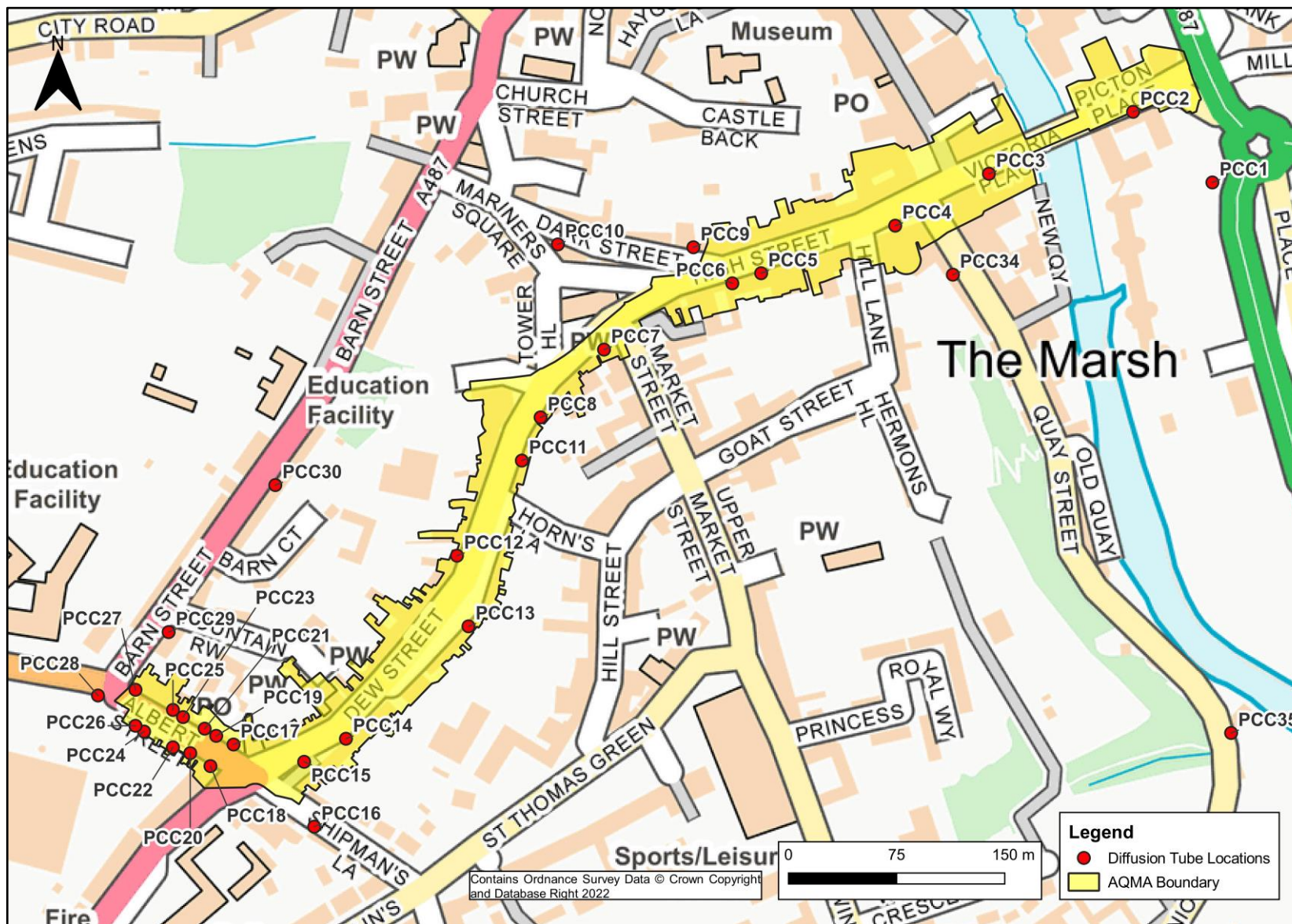
Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) ⁽¹⁾	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
PCC24	Albert St	Roadside	Y - Haverfordwest AQMA	194893	215279	2.0	N	0.0	1.0	1.0
PCC25	Albert St	Roadside	Y - Haverfordwest AQMA	194905	215286	2.0	N	0.0	1.0	1.0
PCC26	Albert St	Roadside	Y - Haverfordwest AQMA	194886	215284	2.0	N	0.0	1.0	1.0
PCC27	Albert St	Roadside	Y - Haverfordwest AQMA	194879	215300	2.0	N	0.0	1.0	1.0
PCC28	Albert St	Roadside	N	194856	215299	2.0	N	0.0	1.0	1.0
PCC29	Barn St	Roadside	N	194901	215345	2.0	N	0.0	1.0	1.0
PCC30	Barn St	Roadside	N	194974	215448	2.0	N	0.0	1.0	1.0
PCC31	Merlins Bridge	Roadside	N	194730	214554	2.0	N	N/A	N/A	1.0
PCC32	Merlins Bridge	Roadside	N	194761	214610	2.0	N	N/A	N/A	1.0
PCC33	Haroldston Terrace	Roadside	N	194774	214465	2.0	N	N/A	N/A	1.0
PCC34	Quay St	Roadside	N	195453	215594	2.0	N	1.0	2.0	1.0
PCC35	Quay St	Roadside	N	195642	215273	2.0	N	1.0	2.0	1.0
PCC36	High St	Roadside	N	210901	214713	2.0	N	1.0	2.0	1.0
PCC40	Main St	Roadside	N	198244	201554	2.0	N	1.0	2.0	1.0
PCC41	Main St	Roadside	Y - Pembroke AQMA	198274	201547	2.0	N	1.0	2.0	1.0
PCC42	Main St	Roadside	N	198333	201549	2.0	N	1.0	2.0	1.0
PCC43	Main St	Roadside	Y - Pembroke AQMA	198364	201502	2.0	N	1.0	2.0	1.0
PCC44	Main St	Roadside	Y - Pembroke AQMA	198396	201495	2.0	N	1.0	2.0	1.0

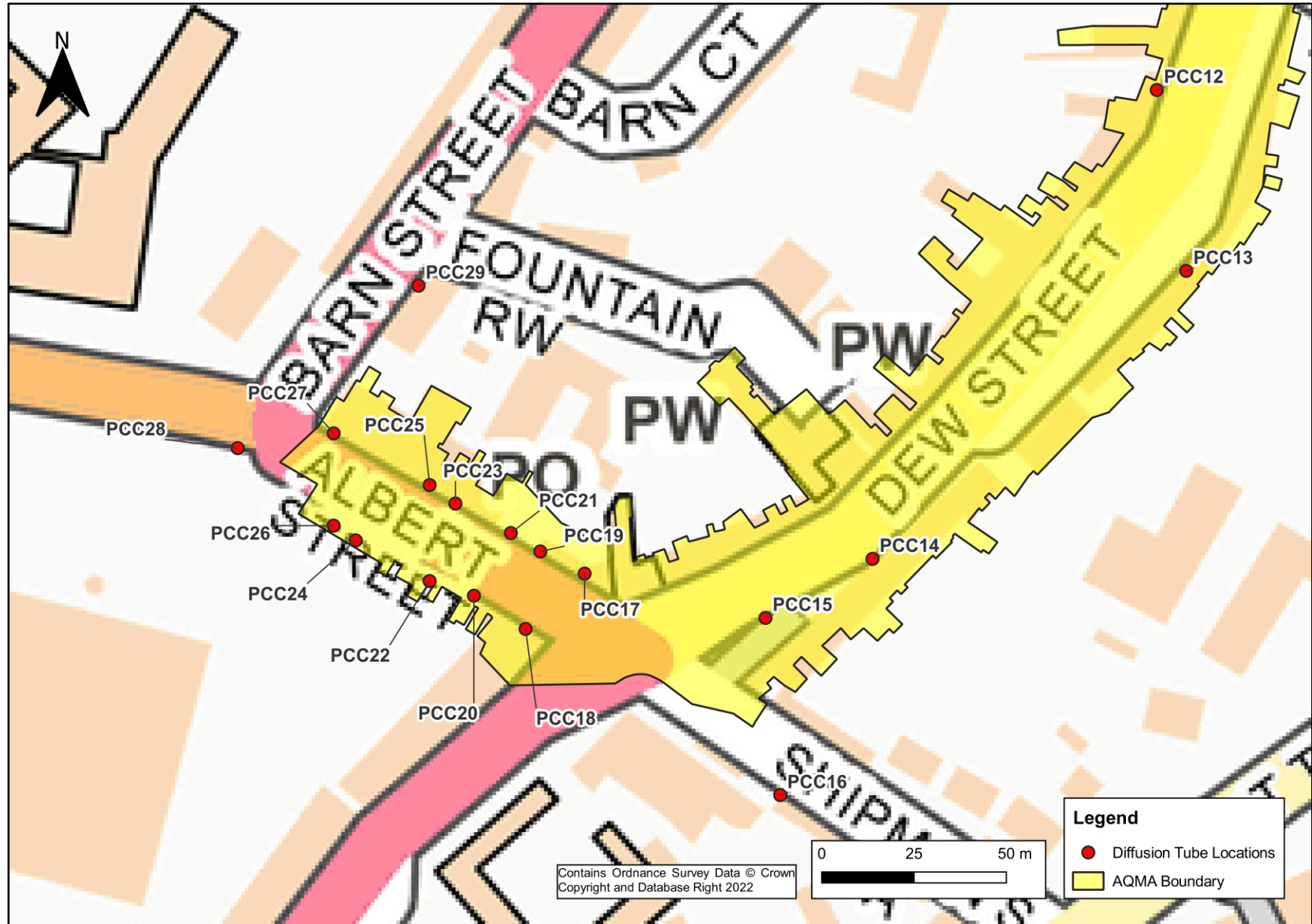
Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) ⁽¹⁾	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
PCC45	Main St	Roadside	Y - Pembroke AQMA	198407	201489	2.0	N	1.0	2.0	1.0
PCC46	Main St	Roadside	Y - Pembroke AQMA	198460	201464	2.0	N	1.0	2.0	1.0
PCC47	Main St	Roadside	Y - Pembroke AQMA	198548	201419	2.0	N	1.0	2.0	1.0
PCC48	Main St	Roadside	N	198869	201299	2.0	N	1.0	2.0	1.0

Notes:

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

Figure 2.2 – Maps of Non-Automatic Monitoring Site in Haverfordwest





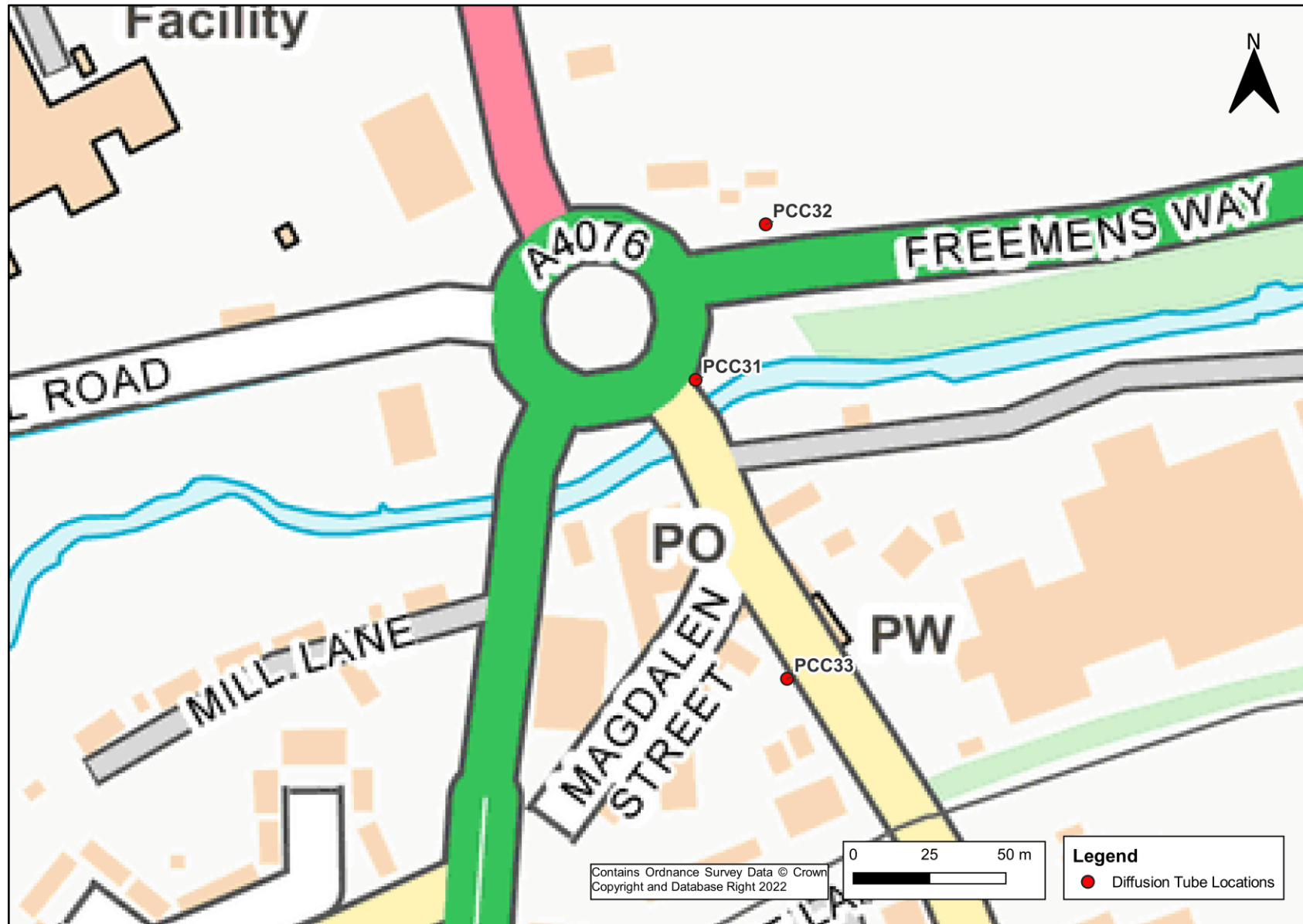


Figure 2.3 – Map of Non-Automatic Monitoring Sites in Pembroke

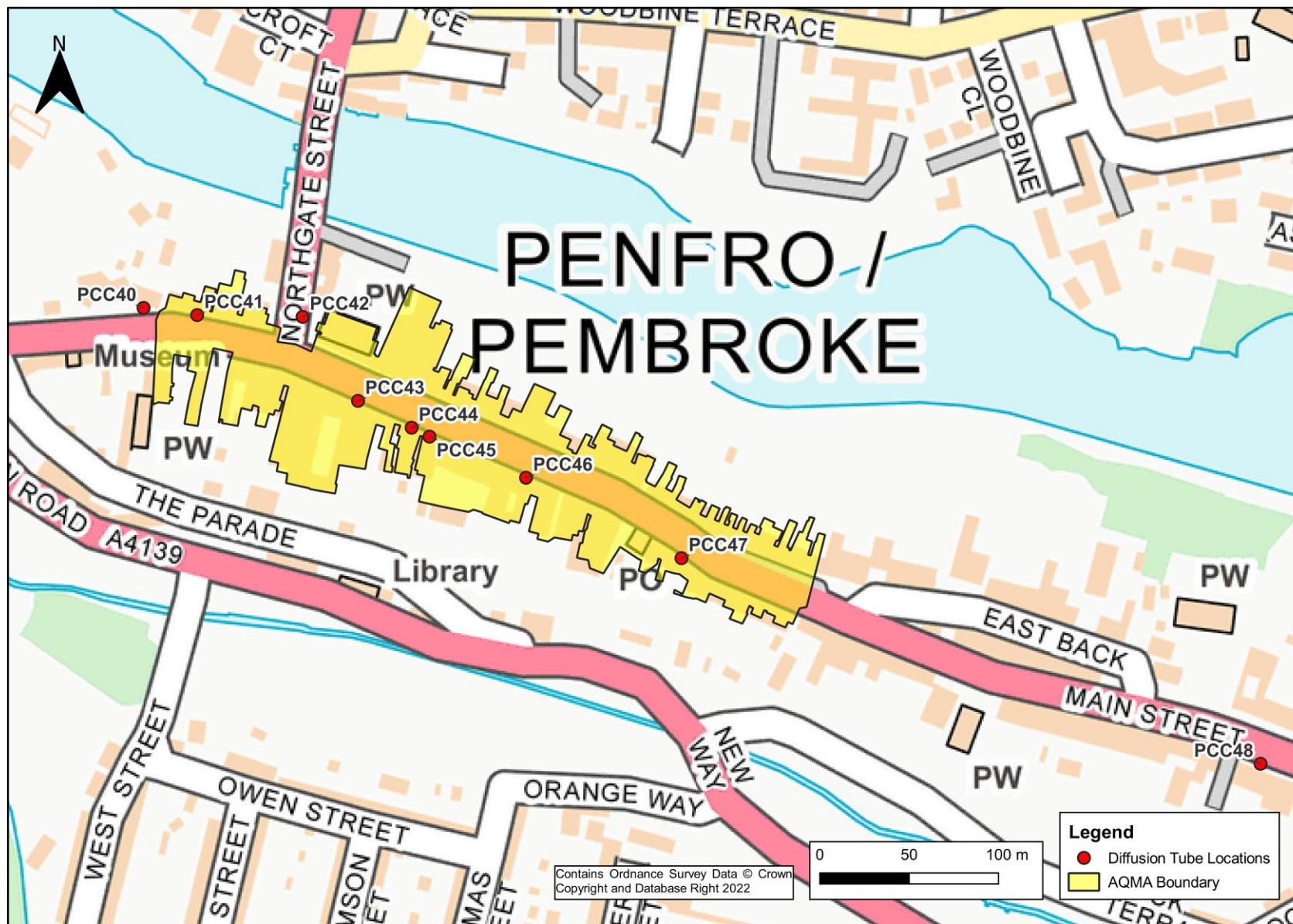


Figure 2.4 – Map of Non-Automatic Monitoring Sites in Narberth

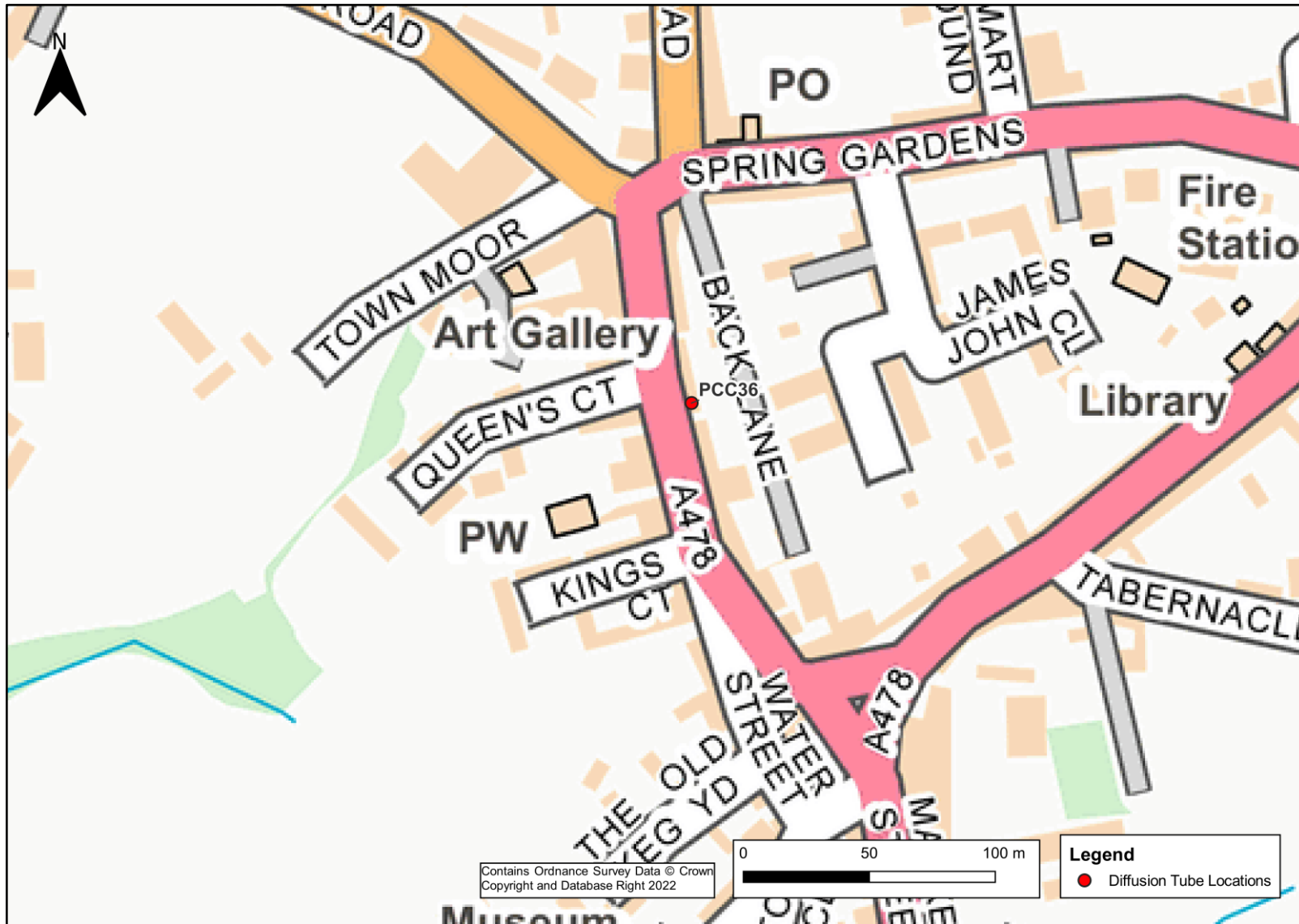
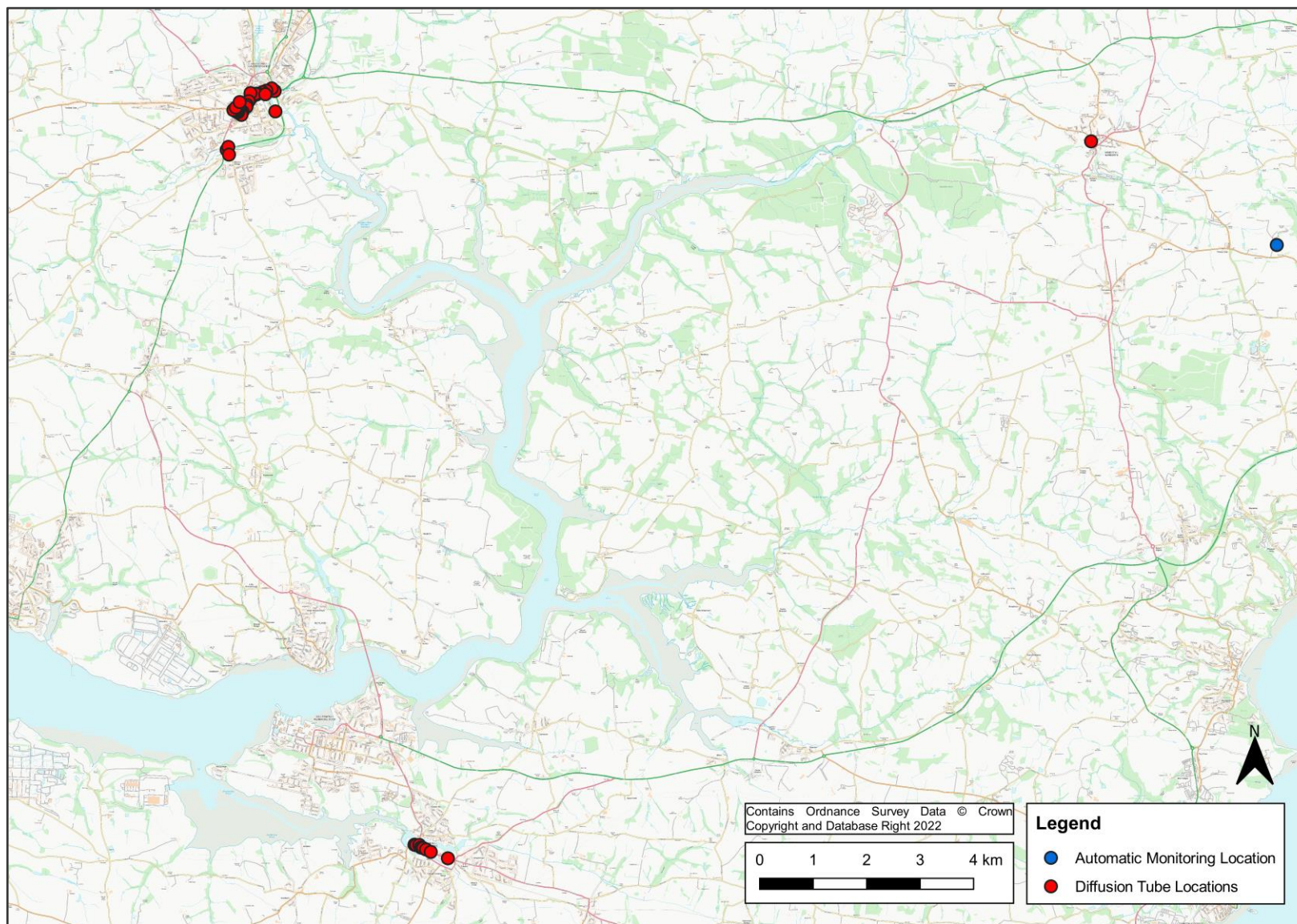


Figure 2.5 – Spatial Map of Pembrokeshire's Automatic and Non-Automatic Monitoring Network



2022 Air Quality Monitoring Results

Table 2.3 – Annual Mean NO₂ Monitoring Results (µg/m³)

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
PEMB	Rural	Automatic	97.2	97.2	4	4	3.1	3.1	2.9
PCC1	Roadside	Diffusion Tube	100	100.0	20.7	20.2	13.7	17.3	16.2
PCC2	Roadside	Diffusion Tube	100	100.0	26.4	25.6	16.2	19.3	20.6
PCC3	Roadside	Diffusion Tube	57.7	57.7	27.1	26.1	15.8	18.9	16.4
PCC4	Roadside	Diffusion Tube	57.7	57.7	30.6	32.1	24.8	26.9	22.9
PCC5	Roadside	Diffusion Tube	100	100.0	36.9	38.8	28.9	29.1	26.8
PCC6	Roadside	Diffusion Tube	92.3	92.3	33.6	33.2	24.2	27.9	25.9
PCC7	Roadside	Diffusion Tube	100	100.0	35.6	35.4	25.2	29.6	27.5
PCC8	Roadside	Diffusion Tube	92.3	92.3	29.3	28.6	19.9	22.4	22.0
PCC9	Roadside	Diffusion Tube	92.3	92.3	23.1	21.8	16.3	18.5	18.9
PCC10	Roadside	Diffusion Tube	100	100.0	15.1	15.7	13.4	12.1	13.4
PCC11	Roadside	Diffusion Tube	82.7	82.7	32.2	29.8	20.3	23.0	22.3
PCC12	Roadside	Diffusion Tube	84.6	84.6	28.2	27.3	20.0	24.0	21.1
PCC13	Roadside	Diffusion Tube	100	100.0	28.4	27.2	18.5	22.1	20.7
PCC14	Roadside	Diffusion Tube	84.6	84.6	24.4	24.3	16.5	19.4	20.3
PCC15	Roadside	Diffusion Tube	50	50.0	29.6	30.2	19.2	21.6	22.9
PCC16	Roadside	Diffusion Tube	75	75.0	19.2	19.3	12.6	13.7	15.2
PCC17	Roadside	Diffusion Tube	82.7	82.7	28.5	23.3	20.5	23.6	23.3
PCC18	Roadside	Diffusion Tube	100	100.0	36.0	35.4	24.3	28.4	26.3
PCC19	Roadside	Diffusion Tube	100	100.0	25.6	24.1	16.7	20.3	19.2
PCC20	Roadside	Diffusion Tube	92.4	92.3	35.1	36.5	26.1	30.4	26.7
PCC21	Roadside	Diffusion Tube	100	100.0	17.6	17.2	11.6	14.6	13.7
PCC22	Roadside	Diffusion Tube	90.4	90.4	35.8	35.8	24.7	29.2	26.7
PCC23	Roadside	Diffusion Tube	75	75.0	28.0	26.1	18.5	21.9	19.9
PCC24	Roadside	Diffusion Tube	90.4	90.4	34.8	34.7	23.3	28.1	25.8
PCC25	Roadside	Diffusion Tube	90.4	90.4	24.0	22.7	16.1	20.0	18.7
PCC26	Roadside	Diffusion Tube	90.4	90.4	35.5	37.1	22.6	27.7	25.6
PCC27	Roadside	Diffusion Tube	92.3	92.3	24.5	23.9	16.3	18.8	19.1
PCC28	Roadside	Diffusion Tube	75	75.0	19.5	20.2	13.8	16.4	14.4

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
PCC29	Roadside	Diffusion Tube	100	100.0	22.8	21.9	15.5	19.8	18.2
PCC30	Roadside	Diffusion Tube	100	100.0	15.7	14.7	10.3	11.8	11.6
PCC31	Roadside	Diffusion Tube	92.3	92.3	29.8	29.9	21.9	27.7	27.6
PCC32	Roadside	Diffusion Tube	90.4	90.4	31.6	33.7	23.4	27.2	24.4
PCC33	Roadside	Diffusion Tube	65.4	65.4	22.1	23.0	16.9	19.8	17.1
PCC34	Roadside	Diffusion Tube	82.7	82.7	21.2	21.1	13.1	16.1	16.4
PCC35	Roadside	Diffusion Tube	100	100.0	12.8	12.2	8.2	9.1	9.9
PCC36	Roadside	Diffusion Tube	100	100.0	22.8	21.3	15.0	17.9	17.1
PCC40	Roadside	Diffusion Tube	100	100.0	20.7	21.0	15.2	17.8	16.5
PCC41	Roadside	Diffusion Tube	100	100.0	24.4	24.5	17.2	21.0	18.3
PCC42	Roadside	Diffusion Tube	92.3	92.3	19.7	22.1	14.2	16.7	17.5
PCC43	Roadside	Diffusion Tube	100	100.0	31.7	32.5	22.5	26.1	23.7
PCC44	Roadside	Diffusion Tube	100	100.0	36.4	35.4	26.1	29.5	26.6
PCC45	Roadside	Diffusion Tube	100	100.0	41.2	39.3	29.1	36.0	32.2
PCC46	Roadside	Diffusion Tube	84.6	84.6	35.5	34.3	24.7	29.5	27.4
PCC47	Roadside	Diffusion Tube	100	100.0	23.6	23.9	15.7	19.9	17.9
PCC48	Roadside	Diffusion Tube	100	100.0	12.1	12.6	8.6	10.4	9.8

Notes:

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

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

Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG22 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 2.6 – Trends in Annual Mean NO₂ Concentrations at Narberth

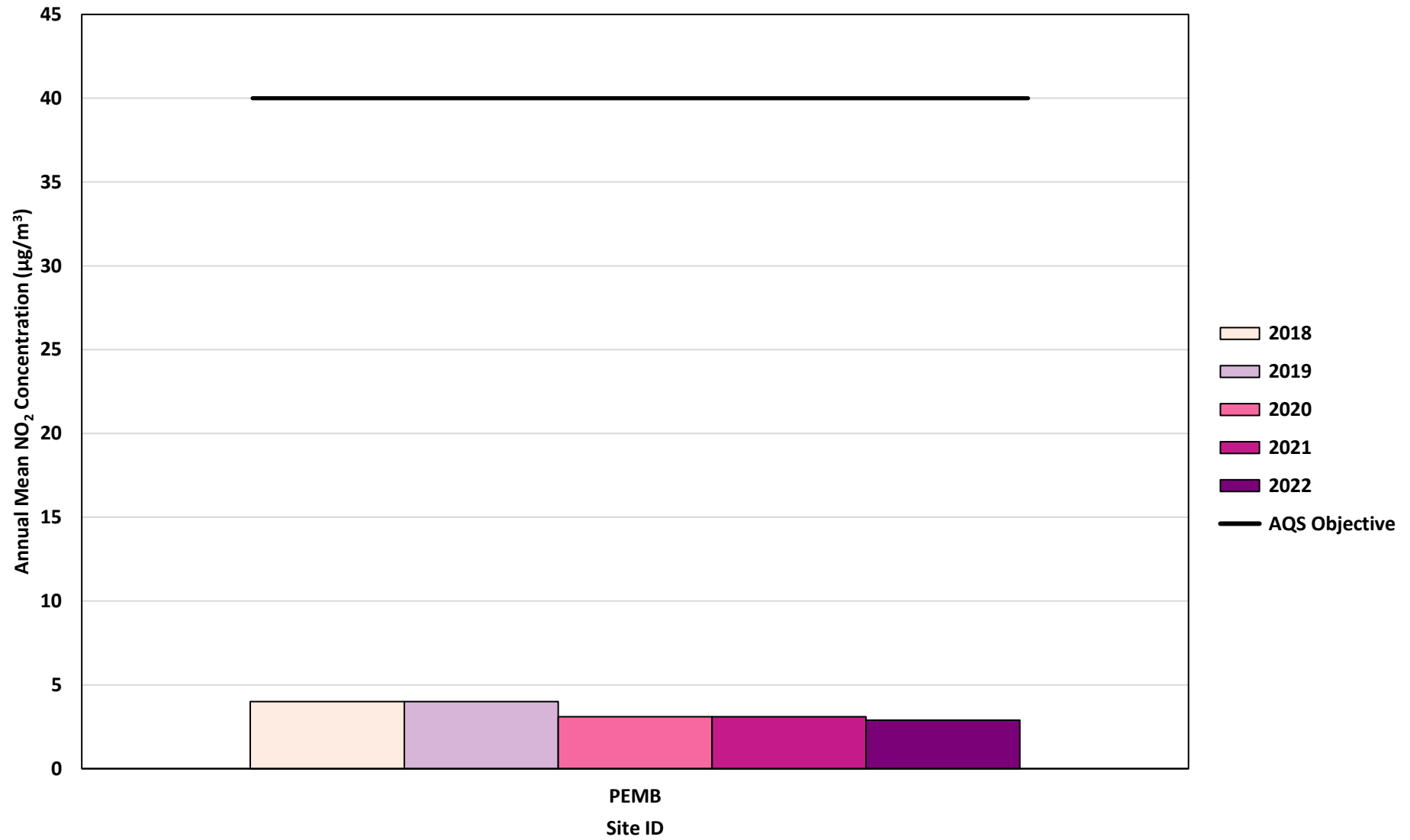


Figure 2.7 – Trends in Annual Mean NO₂ Concentrations in Haverfordwest

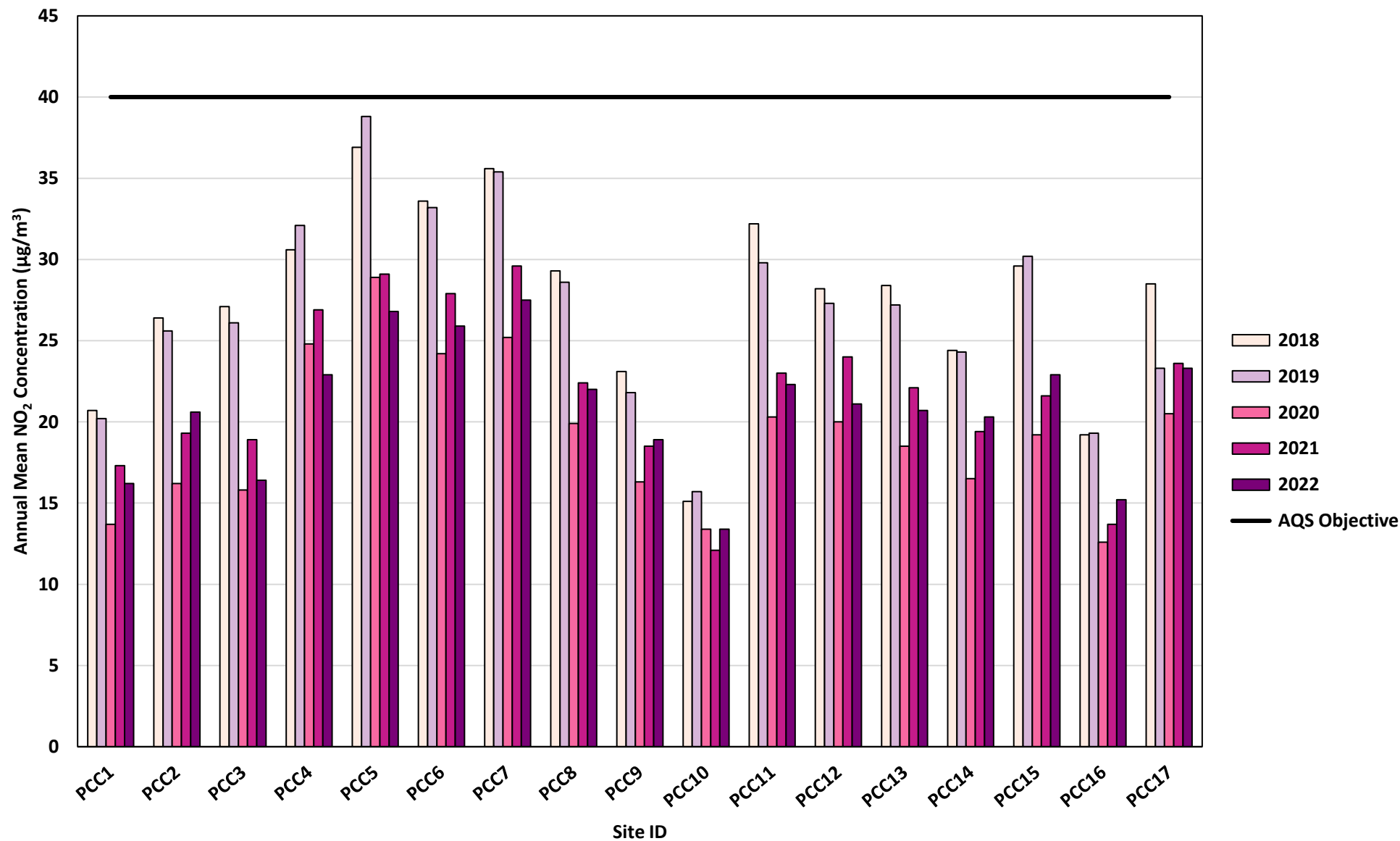


Figure 2.8 – Trends in Annual Mean NO₂ Concentrations in Haverfordwest

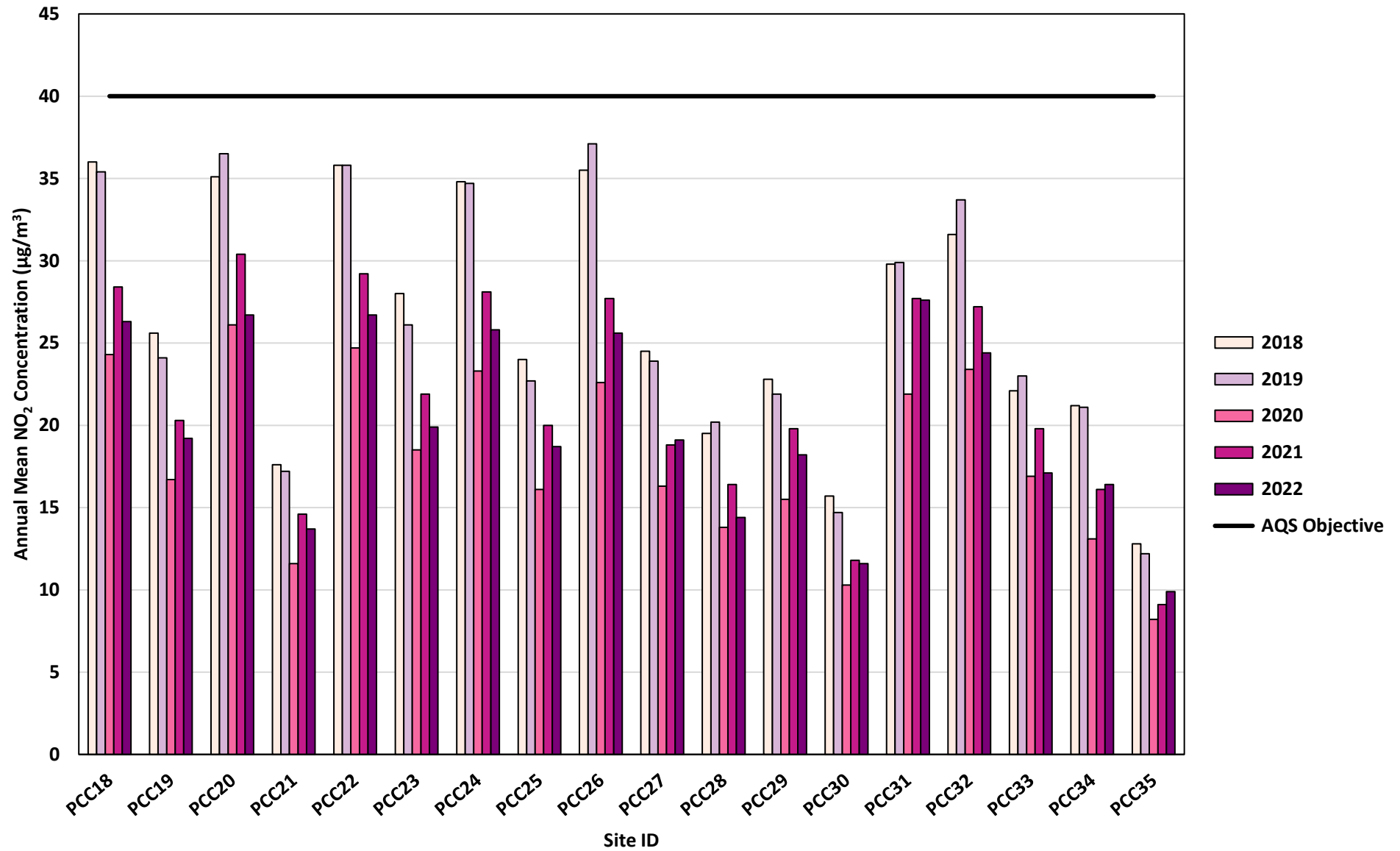


Figure 2.9 – Trends in Annual Mean NO₂ Concentrations in Haverfordwest and Narberth

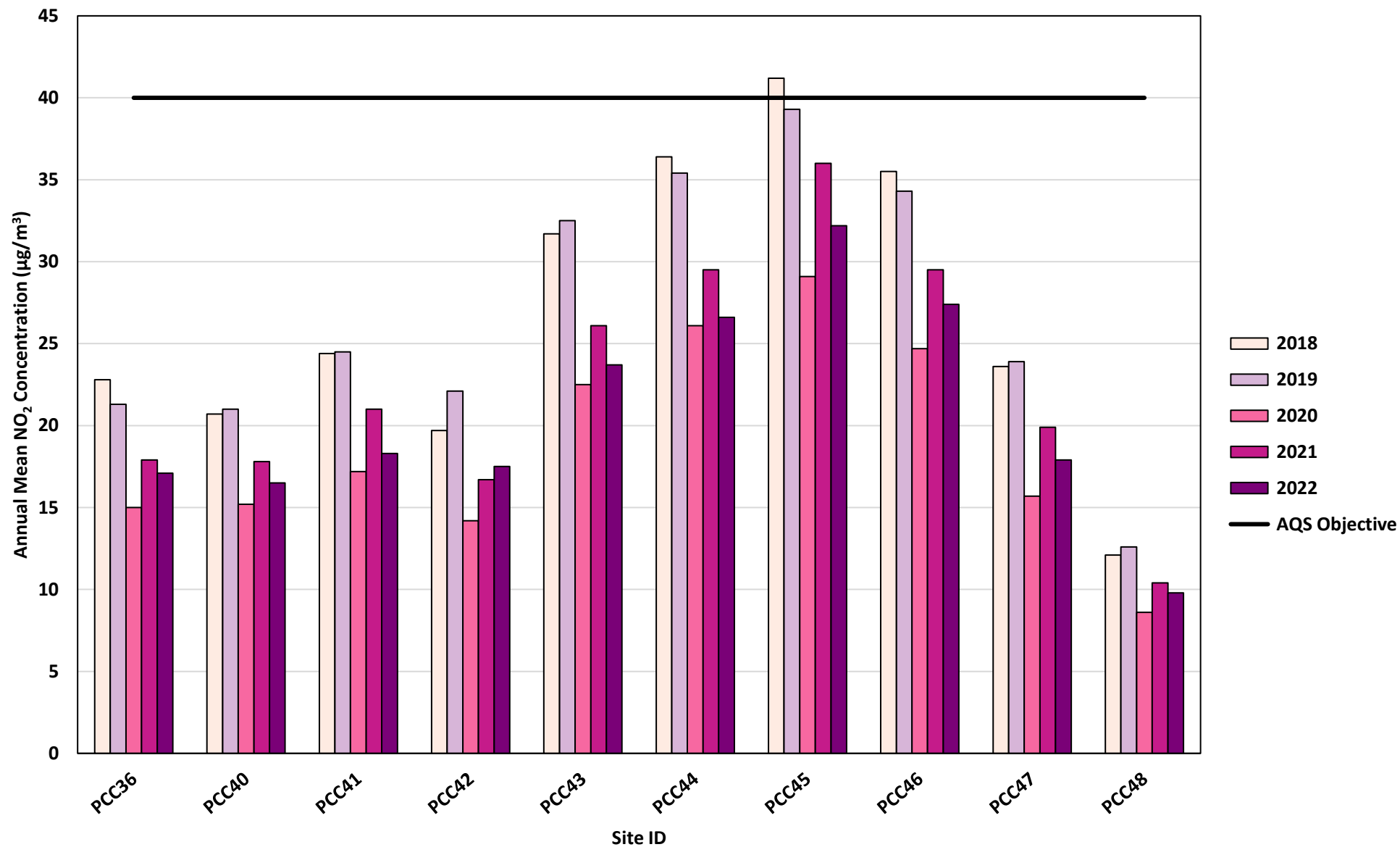


Table 2.4 – 1-Hour Mean NO₂ Monitoring Results, Number of 1-Hour Means > 200µg/m³

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
PEMB	Rural	Automatic	97.2	97.2	0	0	0	0	0

Notes:

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

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

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

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

Table 2.5 - Annual Mean PM₁₀ Monitoring Results (µg/m³)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
PEMB	Rural	99.6	99.6	12	11	10.5	10.1	11.3

Notes:

Exceedances of the PM₁₀ annual mean objective of 40µg/m³ are shown in **bold**.

All means have been “annualised” as per LAQM.TG22 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 2.10 – Trends in Annual Mean PM₁₀ Concentrations at Narberth

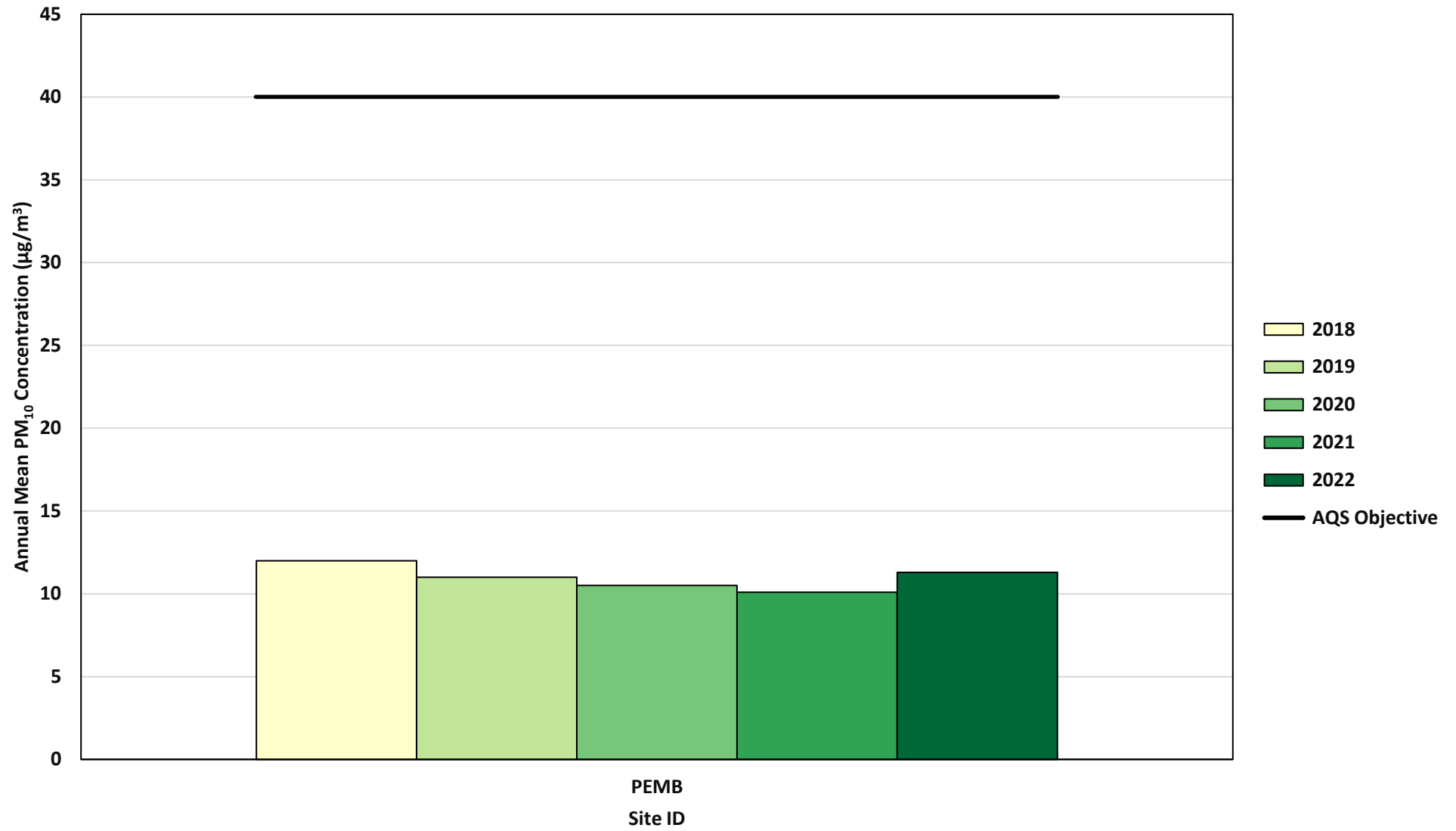


Table 2.6 – 24-Hour Mean PM₁₀ Monitoring Results, Number of PM₁₀ 24-Hour Means > 50µg/m³

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
PEMB	Rural	99.6	99.6	0	0	1	0	2

Notes:

Exceedances of the PM₁₀ 24-hour mean objective (50µg/m³ not to be exceeded more than 35 times/year) are shown in **bold**.

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

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

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

Table 2.7 – PM_{2.5} Monitoring Results (µg/m³)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
PEMB	Rural	99.6	99.6	6	7	5.9	6	6.4

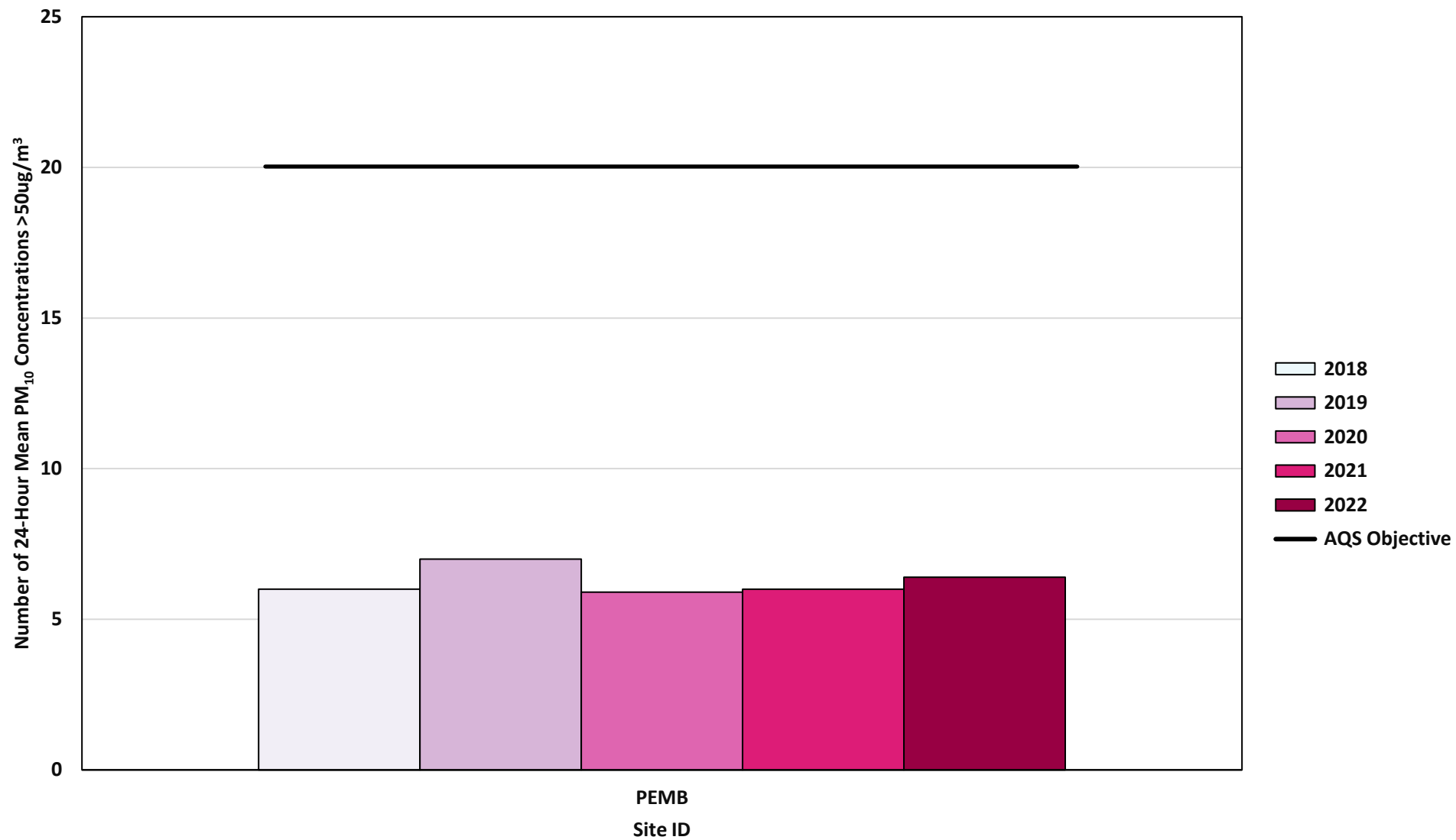
Notes:

All means have been “annualised” as per LAQM.TG22 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 2.11 – Trends in Annual Mean PM_{2.5} Concentrations at Narberth



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

2.1.3 Nitrogen Dioxide (NO₂)

The automatic monitoring station located in Narberth continues to report compliance with the annual mean NO₂ AQS objective, with stable concentrations fluctuating between 3 to 4 µg/m³. This is expected due to the rural nature of the monitoring site.

During 2022 there were no exceedances of the NO₂ AQS objective, with the majority of passive monitoring sites recording concentrations well under the objective. From 2021 to 2022 35 sites reported decreases in NO₂. The maximum NO₂ annual mean concentration in 2022 was 32.2 µg/m³, reported at PCC45 which is located along Main St within the Pembroke AQMA.

Both Haverfordwest and Pembroke AQMAs continue to report compliance, with both Haverfordwest and Pembroke reporting three years of full compliance. However, concentrations at monitoring location PCC45 have shown to be fluctuating near to 40 µg/m³ over the past five years. Therefore, there is currently no intention to revoke both AQMAs. However, monitoring data will continue to be reviewed at this site over the subsequent years, and in the event of continual decreases, further assessment will be completed into revocation. If monitored decreases are reported at PCC45, Pembrokeshire may look to initiate the revocation process of Haverfordwest AQMA.

There are no passive monitoring sites where the NO₂ annual mean is greater than 60 µg/m³, therefore in accordance with Defra LAQM.TG(22) there are no sites likely to be at risk of exceeding the 1-hour mean AQS objective.

As all annual mean NO₂ concentrations reported below 36 µg/m³, fall-off with distance correction calculations have not been carried out.

2.1.4 Particulate Matter (PM₁₀)

During 2022 the Narberth automatic monitoring site recorded PM₁₀ concentrations well below the 40 µg/m³ PM₁₀ AQS objective. There is a minor reduction of 1.2 µg/m³ from 2021, overall, the annual mean concentration remains relatively stable and consistent over the last five years.

There was only 2 exceedances of the 24-hour mean concentrations in excess of 50 µg/m³ in 2022, therefore compliance to the 24-hour AQS objective.

Data capture at Narberth automatic monitoring station in 2021 was greater than 75%, therefore annualisation was not required to be carried out, in accordance with LAQM.TG(22).

2.1.5 Particulate Matter (PM_{2.5})

During 2022 the Narberth automatic monitoring site recorded PM_{2.5} concentrations well below the PM_{2.5} AQS target of 20 µg/m³. There is a minor increase of 0.4 µg/m³ from 2021, but overall, the annual mean concentrations remains relatively stable and consistent over the last five years. There is no LAQM air quality objective for PM_{2.5}, however concentrations continue to remain low and consistent.

2.1.6 Other Pollutants Monitored Ozone

The number of 8-hour mean O₃ concentrations greater than 100 µg/m³ reported at the Narberth automatic monitoring location in 2022 was 27. There is no LAQM air quality objective for O₃, however this does exceed the UK National air quality objective of 100 µg/m³ not to be exceeded more than 10 times a year.

2.1.7 Sulphur Dioxide (SO₂)

For SO₂, the number of 15-minute mean concentrations greater than 266 µg/m³, 1-hour mean concentrations greater than 350 µg/m³, and 24-hour mean concentrations greater than 125 µg/m³ reported at the Narberth automatic monitoring location in 2022 were all 0. There are three LAQM air quality objectives for SO₂, and Pembrokeshire is compliant for all 3 air quality objectives.

Summary of Compliance with AQS Objectives as of 2022

Pembrokeshire County Council has examined the results from monitoring in the county, concentrations are all below the relevant objectives, therefore no further action is required.

3 New Local Developments

Pembrokeshire County Council confirms that there are no new or newly identified local developments which may have an adverse impact on air quality within the Local Authority area within 2022.

Pembrokeshire 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

Marine Energy Project

A £60 million 'Marine Energy Project' that will help tackle climate change while reviving Pembrokeshire's economy in the wake of COVID – 19 has been given approval. The UK and Welsh Government have now approved the business case for the Pembroke Dock Marine project, which is expected to generate £73.5 million a year to the Swansea Bay City Region's economy. The project consists of four elements, inclusive of a large facility, up to 90 km² Pembrokeshire Demonstration Zone delivered by Wave Hub Limited that will enable the deployment of future energy generating technologies, including floating wind. In addition to this, the redevelopment of land at Pembroke Dock, led by the Port of Milford Haven, to deliver the infrastructure needed by the industry as it continues to mature.

Pembroke Power Station

The Pembroke carbon capture initiative is being developed by RWE as one of three new carbon capture projects across the UK. The project is a key part of RWE's Pembroke Net Zero Centre (PNZC) which is a major multi-technology decarbonisation initiative which supports the broader decarbonisation of the region's industry as part of the South Wales Industrial Cluster.

RWE is currently progressing with its initial environmental studies and surveys and is preparing information in order to apply to the Department for Energy Security and Net Zero's Track 2 Phase 2 cluster sequencing funding application process, which is dedicated to carbon capture projects that are located close to carbon capture storage or transport facilities.

Road Traffic Sources (and Other Transport)

There has been no identification of any new road traffic and other transport sources of concern since the last APR.

Industrial / Fugitive or Uncontrolled Sources / Commercial Sources

There has been no identification of any new industrial, fugitive or uncontrolled sources and/or commercial sources of concern since the last APR.

Other Sources

Pembrokeshire 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.

Pembrokeshire 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

Local / Regional Air Quality Strategy

Pembrokeshire County Council provide annual reports to the Wales Climate Change Strategy to assist in assessing sector specific emission reduction targets specifically energy and/or green-house gas emissions from the public sector in Wales in relation to the Authority's;

- Housing stock.
- Non-domestic buildings.
- Fleet vehicles and transport provisions.

Encompassing emissions from energy use in buildings, community wide emissions from private sector housing, fleet transport and business travel. The data is compiled and returned as;

- Utility supplier information.
- Annual Welsh Assembly Government Returns.
- Carbon Reduction Commitment Energy Efficiency Scheme returns.
- Annual surveys.
- Internal Business Plan reporting.
- Returns from site managers.

Other reporting indicators to assist strategy development are;

- Welsh Assembly Government National Strategic Indicator EEF/002a (NS18a) (NSPI19) for percentage reduction in carbon emissions in the councils nondomestic public stock;
- Internal local indicator HC HC2 for percentage reduction in carbon emissions
- in the council's non-domestic public stock since 2003;
- Welsh Assembly Government National Strategic Indicator EEF/002bi (NS18bi)
- for percentage reduction in energy use in the housing stock; and,
- Transport emissions reporting.

In 2014 local authorities were advised by the Welsh Assembly Government that the European Commission had formally launched infraction proceedings against the UK for breaching nitrogen dioxide limit values under the EU Air Quality Directive 2008/50.

Pembrokeshire County Council, along with all local authorities, completed a log sheet as requested to assist with the development of a National Air Quality Plan to resolve the nitrogen dioxide exceedance.

In July 2017 the UK Government announced that new petrol and diesel cars and vans will be phased out by 2040 in a bid to tackle air pollution with a £255m fund to help councils tackle emissions from diesel vehicles as part of a £3bn package of spending on air quality. The Party of Wales aim to phase out the sale of new petrol and diesel only cars and vans in Wales by 2027.

Air Quality Planning Policies

Pembrokeshire County Council, Carmarthenshire County Council, Ceredigion County Council and Powys County Council have developed and published the [Mid and West Wales Air Quality: A Guide for Developers](#) guidance document in 2012. This a reference document intended for use by developers and advisers who may be involved in the assessment of air quality at proposed developments. This document details the information required by the Local Planning Authority in order to accurately assess the impact of a planning application on air quality. This document was last updated in 2012.

The guidance focuses on:

- Pollutants regulated under the LAQM regime, as well as PM_{2.5};
- Impacts of traffic emissions;
- Impacts of emissions from biomass boilers; and,
- The assessment and control of dust impacts during construction.

Where a proposed development is likely to give have significant negative air quality impacts on the surrounding areas or is in an area of existing poor air quality, the planning process required an air quality assessment to be carried out. Additionally, measures to reduce and minimise any adverse impacts are also to be required.

The guidance also aims to provide advice on describing air quality impacts and assessing their significance.

It is highly recommended that dialogue between the developers, planners, and pollution control officers begins as early as possible. Failure to provide adequate supporting information with the planning application may result in significant delays in the planning process, or planning permission may be refused by the Local Planning Authority.

Local Transport Plans and Strategies

The [Joint Transport Plan for South West Wales 2015 – 2020](#) is in effect as the Local Transport Plan initiative. This also details medium and long-term projects and aspirations spanning to 2030.

The Local Transport Plan is intended to “improve transport and access within and beyond the region to facilitate economic regeneration, reduce deprivation and support the development and use of sustainable and healthier modes of transport”. The primary objectives are detailed as follows:

1. To improve the efficiency and reliability of the movement of people and freight within and beyond South West Wales to support economic growth in the Swansea Bay City Region.
2. To improve access for all to a wide range of services and facilities including employment and business, education and training, health care, tourism and leisure activities.
3. To improve the sustainability of transport by improving the range and quality of, and awareness about, transport options, including those which improve health and wellbeing.
4. To improve integration between policies, service provision and modes of transport in South West Wales.
5. To implement measures which will protect and enhance the natural and built environment and reduce the adverse impact of transport on health and climate change.
6. To improve road safety and personal security in South West Wales.

20mph Speed Programme

In addition to the Joint Transport Plan, Pembrokeshire are introducing 20mph restricted areas within the County from September 2023, the restricted roads are defined as, roads that have lampposts placed no more than 200 yards apart, including typical residential and built up areas of high pedestrian activity.

The first phase of the [20mph speed programme](#) has been set up in eight communities across Wales for an initial trail, within Pembrokeshire, the trail area selected community is located within St Dogmaels.

Vehicle Idling Initiative

The partnership initiative supported by Pembrokeshire County Council was initiated within Neyland School, Neyland School have environmental champions who patrol the school parking areas at drop off and pick up asking vehicles to turn their engines off whilst waiting. Pembrokeshire County Council also funded the inclusion of signs to support the school.

Active Travel Plans and Strategies

Pembrokeshire County Council details information on [Active Travel Plans](#) currently in place on their website. These are important for joint wins in promoting healthier lifestyles alongside reducing the negative impacts of traffic upon neighbourhoods and communities.

Pembrokeshire County Council took part in Clean Air Day 2022, consisting of a no idling initiative with local schools and the production of banners to locate outside schools to educate parents/drivers taking children to school. More details are provided on their website: Pupils lead project to get parents to switch off car engines at the school gates - Pembrokeshire County Council.

Local Authorities Well-being Objectives

Information on Pembrokeshire County Council's Well-Being Plan and objectives are available to view on their [website](#). This sets out how the Public Services Board will work together to improve the well-being of people and communities in Pembrokeshire both now, and in the future.

Green Infrastructure Plans and Strategies

Pembrokeshire County Council's [Green Infrastructure Plans](#) are available on their website. These are intended to guide Green Infrastructure improvements within settlements, to be used by public, private and voluntary sector bodies.

Climate Change Strategies

Pembrokeshire County Council's [Climate Change Strategies](#) are available on their website. The plan is designed to outline work Pembrokeshire County Council has currently undertaken to steer Pembrokeshire County Council towards becoming net zero-carbon by 2030.

5 Conclusion and Proposed Actions

Conclusions from New Monitoring Data

The passive NO₂ monitoring data from 2022 shows that 35 out of 45 monitoring locations reported a decrease in concentrations from 2021, with an average decrease of 4.8%. All annual mean NO₂ concentrations have complied with the NO₂ annual mean AQS objective and remain below the AQS objective.

Monitored NO₂, PM₁₀ and PM_{2.5} concentrations at the Narberth automatic monitoring station continue to report annual means well below the AQS annual mean objectives for NO₂, PM₁₀ and PM_{2.5} (2.9 µg/m³, 11.3 µg/m³ and 6.4 µg/m³ respectively), and short term SO₂ AQS objectives. In regard to the short term AQS objective for NO₂, in which the 200 µg/m³ must not be exceeded more than 18 times/year, and the PM₁₀ AQS objective whereby there should be no more than 35 24-hour mean concentrations greater than 50 µg/m³, there were no exceedances reported in both pollutants in 2022. The Narberth automatic monitoring station is a rural background site which reports low concentrations amongst all pollutants and is expected to meet AQS objectives on yearly reporting.

Conclusions relating to New Local Developments

Ongoing implementation and development of local strategies, as detailed in Table 1.2, will continue to assist in reducing pollutant concentrations and emissions. The Council also continues to request air quality assessments for new planning applications where relevant, to ensure that there is no significant degradation of air quality or that no new sensitive receptors are being introduced into areas of existing poor air quality. The 'Marine Energy Development: Pembroke Dock Marine' and 'Pembroke carbon capture initiative' are long term developments. The Pembroke Dock Marine has 4 elements, which includes multiple phases of construction: Marine Energy Test Area, Marine Energy Engineering Centre of Excellence, Port Developments and a Pembrokeshire Demonstration Zone.

Other Conclusions

The existing diffusion tube network within Pembrokeshire allows the council to closely monitor hotspot areas and help highlight areas of concern, the monitoring network in 2022 has shown compliance across all monitoring locations. In relation to both designated AQMAs, Haverfordwest and Pembroke has reported three years of compliance. Despite this, monitoring locations within both AQMAs in 2019 (pre-pandemic) display concentrations

within 10% of the AQS objective, halts the potential revocation process of both AQMAs, and cannot be counted as a year of compliance. The Council will continue to use its monitoring network to closely monitor concentrations at these locations.

Proposed Actions

Pembrokeshire County Council will continue to actively monitor NO₂ concentrations, reviewing the diffusion tube network where necessary. Whilst annual mean NO₂ concentrations decreased during 2022, COVID affected years act as outlier, therefore the Council do not intend to revoke any AQMAs at this current time. If concentrations in future years continue to remain low and well below the AQS objective, then the Council will pursue revocation of these AQMAs where appropriate.

References

- Pembrokeshire County Council's Progress Report 2022
- Part IV of the Environment Act 1995, Local Air Quality Management, Technical Guidance LAQM.TG(22) 2022
- Welsh Air Quality Forum data downloads.
- Mid and West Wales Air Quality: A Guide for Developers (2012)
- Joint Transport Plan for South West Wales 2015 – 2020
- Local Air Quality Management in Wales. Policy Guidance June 2017

Appendices

Appendix A: Monthly Diffusion Tube Monitoring Results

Appendix B: A Summary of Local Air Quality Management

Appendix C: Air Quality Monitoring Data QA/QC

Appendix D: AQMA Boundary Maps

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

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

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.83) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
PCC1	28.7	13.3	24.4	19.1	14.4	7.5	16.4	23.3	21.9	19.2	20.5	26.3	19.6	16.2	
PCC2	28.6	19.1	30.0	24.5	18.5	11.6	22.3	27.5	23.9	28.8	30.2	33.4	24.9	20.6	
PCC3	27.9	21.8	22.2	-	16.7	9.7	17.1	-	-	-	-	33.8	21.3	16.4	
PCC4	-	-	29.5	-	-	13.1	25.5	34.1	-	25.7	30.8	35.1	27.7	22.9	
PCC5	42.0	30.1	34.7	35.8	29.9	11.2	30.9	42.2	30.8	25.9	35.4	38.3	32.3	26.8	
PCC6	37.1	29.9	36.4	32.2	24.0	10.4		34.2	26.3	35.4	36.6	41.3	31.2	25.9	
PCC7	37.4	27.3	40.4	34.8	26.7	11.9	32.8	41.3	32.3	35.9	35.3	41.6	33.1	27.5	
PCC8	10.2	-	38.8	27.6	21.9	11.7	26.1	31.6	27.9	28.8	28.5	38.9	26.5	22.0	
PCC9	29.7	-	26.8	24.3	17.0	9.1	17.5	27.3	19.5	21.8	24.2	33.2	22.8	18.9	
PCC10	22.6	8.1	22.1	16.9	12.0	6.3	13.1	16.7	12.9	17.5	20.2	25.2	16.1	13.4	
PCC11	33.8	19.7	36.0	26.6	-	9.7	24.9	-	23.8	26.8	26.0	41.2	26.8	22.3	
PCC12	36.2	24.1	23.8	26.3	20.1	11.0	23.9	-	-	24.0	26.6	38.0	25.4	21.1	
PCC13	37.2	19.1	29.2	25.9	18.3	9.2	19.8	27.9	24.8	23.7	26.1	38.0	24.9	20.7	
PCC14	32.3	19.9	29.2	21.8	16.8	-	-	22.9	20.4	21.7	23.1	36.4	24.5	20.3	
PCC15	-	-	-	-	-	-	21.4	25.8	20.3	26.0	25.4	41.2	26.7	22.9	
PCC16	28.2	-	21.5	16.0	13.2	7.3	-	16.7	15.3	-	20.4	26.2	18.3	15.2	
PCC17	41.1	20.7	31.5	29.8	19.6	12.1	24.4	33.7	28.7	-	-	39.2	28.1	23.3	
PCC18	46.0	31.4	30.7	30.5	25.5	19.9	26.2	34.2	25.5	25.5	40.5	45.0	31.7	26.3	
PCC19	33.0	15.4	28.0	24.3	16.1	8.3	20.8	30.0	23.9	21.2	22.9	34.1	23.2	19.2	
PCC20	47.3	35.1	34.6	31.4	27.9	26.5	29.5	-	28.5	15.1	37.6	40.8	32.2	26.7	
PCC21	25.6	16.1	15.6	13.6	11.8	7.3	11.2	14.3	13.5	24.2	20.9	24.0	16.5	13.7	
PCC22	44.9	32.4	35.3	32.7	26.7	10.4	29.0	34.6	29.8	-	36.0	41.6	32.1	26.7	
PCC23	-	22.2	30.5	-	17.3	9.7	-	30.0	26.9	19.7	25.8	34.2	24.0	19.9	
PCC24	43.9	27.2	34.8	31.4	24.8	10.8	29.0	33.5	30.2	-	36.4	40.3	31.1	25.8	
PCC25	32.5	17.2	26.3	24.3	15.6	9.0	20.7	26.4	22.7	-	22.7	30.9	22.6	18.7	
PCC26	44.2	30.0	35.9	27.4	24.9	11.4	29.2	32.0	27.5	-	35.8	40.5	30.8	25.6	
PCC27	33.6	18.7	27.7	24.2	17.1	9.0	-	25.0	19.0	20.3	23.1	35.4	23.0	19.1	

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.83) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
PCC28	-	-	21.4	-	13.5	8.4	16.1	21.3	16.9	13.9	18.1	26.2	17.3	14.4	
PCC29	29.2	17.1	25.9	22.9	18.0	8.0	18.5	26.1	20.6	23.5	22.7	30.8	21.9	18.2	
PCC30	20.2	9.8	16.1	11.7	10.2	6.7	12.4	13.1	11.3	14.8	16.1	24.7	13.9	11.6	
PCC31	40.2	32.9	32.3	33.1	28.4	-	30.9	36.8	35.0	29.7	29.8	37.1	33.3	27.6	
PCC32	37.6	27.1	33.8	27.2	25.8	12.7	27.1	36.1	26.5	-	31.5	37.4	29.3	24.4	
PCC33	30.8	-	29.3	-	18.6	8.5	19.3	-	22.9	-	21.6	29.8	22.6	17.1	
PCC34	30.0	20.4	19.9	18.1	14.6	7.6	16.0	20.4	-	-	22.3	28.6	19.8	16.4	
PCC35	16.9	10.4	14.7	11.0	7.9	3.8	9.3	12.3	11.1	13.3	14.1	18.7	12.0	9.9	
PCC36	27.7	13.1	28.2	20.5	14.8	9.0	19.7	27.5	21.1	18.5	21.1	25.2	20.5	17.1	
PCC40	24.6	13.0	21.1	22.5	17.4	11.7	21.5	27.5	21.0	17.7	19.8	21.3	19.9	16.5	
PCC41	31.5	16.9	26.6	22.6	20.7	10.4	21.9	32.0	23.0	10.9	24.3	23.2	22.0	18.3	
PCC42	25.1	15.0	31.9	26.2	18.4	8.8	-	27.4	18.0	19.7	20.9	20.7	21.1	17.5	
PCC43	34.1	27.9	36.1	32.0	28.3	10.1	26.7	33.1	23.1	30.0	34.2	27.0	28.5	23.7	
PCC44	40.2	30.5	42.3	35.8	30.3	11.5	29.3	37.3	26.6	32.8	33.2	34.6	32.0	26.6	
PCC45	48.2	35.7	50.1	44.3	35.3	13.2	39.3	44.1	36.2	39.4	40.4	39.3	38.8	32.2	
PCC46	44.3	35.6	33.3	30.6	28.9	-	30.7	36.9	24.8	30.5	-	35.0	33.1	27.4	
PCC47	31.6	23.7	26.8	21.9	20.1	9.7	17.9	23.3	19.4	18.4	25.3	21.0	21.6	17.9	
PCC48	18.4	10.9	13.8	10.7	9.3	5.5	9.2	12.3	8.8	14.5	14.5	13.7	11.8	9.8	

Notes:

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

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

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

(2) Distance corrected to the nearest relevant public exposure

Appendix B: A Summary of Local Air Quality Management

Purpose of an Annual Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in the Environment Act 1995, as amended by the Environment Act 2021, 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 must then be reviewed and updated no later than every five years; or if a local authority considers there is a need for further or different measures to be taken in order to achieve air quality standards; or if significant changes to sources occur within your local area.

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

Air Quality Objectives

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

The table shows the objectives in units of microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (milligrammes per cubic metre, 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 (NO₂)	200µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
Nitrogen Dioxide (NO₂)	40µg/m ³	Annual mean	31.12.2005
Particulate Matter (PM₁₀)	50µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2010
Particulate Matter (PM₁₀)	40µg/m ³	Annual mean	31.12.2010
Sulphur dioxide (SO₂)	350µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
Sulphur dioxide (SO₂)	125µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
Sulphur dioxide (SO₂)	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

Pembrokeshire County Council's diffusion tubes in 2020 were supplied and analysed by Gradko International Ltd., using the 20% Triethanolamine (TEA) in water preparation method. Gradko's laboratory is UKAS accredited, participating in the AIR-PT Scheme for NO₂ tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO₂ concentrations reported are of a high calibre. The lab follows the procedures set out in the Harmonisation Practical Guidance.

All local authority co-location studies which use tubes supplied by Gradko with the 20% TEA in water preparation method in 2022 were rated as 'good', as shown by the precision summary results. This precision reflects the laboratory's performance and consistency in preparing and analysing the tubes, as well as the subsequent handling of the tubes in the field. Tubes are considered to have a "good" precision where the coefficient of variation of duplicate or triplicate diffusion tubes for eight or more monitoring periods during a year is less than 20%.

Monitoring in 2022 was completed in adherence with the 2022 [Diffusion Tube Monitoring Calendar](#), whereby most changeovers were completed within ± 2 days of the specified date.

Diffusion Tube Annualisation

[LAQM.TG\(22\)](#) states that annualisation is required for any site which has a data capture of less than 75%, but greater than 25%. Passive monitoring site PCC3, PCC4, PCC15 and PCC33 recorded data captures of 57.7%, 57.7%, 50% and 65.4% respectively in 2022, therefore required annualisation. Annualisation was completed using version 2.0 of the 'Diffusion Tube Data Processing Tool'. Two continuous background monitoring locations were used:

- Cardiff; and
- Cwmbran Crownbridge

The Cwmbran Crownbridge monitoring station was located outside the 50 mile radius due to limited AURN sites within the preferred radius, the sites selected to annualise the data were Cardiff and Cwmbran Crownbridge.

Two continuous background monitoring sites were applicable to use as they all had >85% data capture and therefore could be used for annualisation. Table C.1 presents the annualisation summary, taken from the 'Diffusion Tube Data Processing Tool'.

Table C.1 – Annualisation Summary (concentrations presented in µg/m³)

Site ID	Annualisation Factor Cardiff	Annualisation Factor Cwmbran Crownbridge	Average Annualisation Factor	Raw Data Simple Annual Mean (µg/m ³)	Annualised Data Simple Annual Mean (µg/m ³)
PCC3	0.9495	0.9010	0.9252	21.3	19.7
PCC4	0.9936	0.9963	0.9950	27.7	27.5
PCC15	1.0025	1.0626	1.0325	26.7	27.5
PCC33	0.9293	0.8921	0.9107	22.6	20.6

Diffusion Tube Bias Adjustment Factors

Pembrokeshire County Council have applied a national bias adjustment factor of 0.83 to the 2022 monitoring data. A summary of bias adjustment factors used by Pembrokeshire County Council over the past five years is presented in Table C.2.

No co-location studies are carried out by Pembrokeshire County Council therefore only the national factor could be applied. The national factor for Gradko 20% TEA in water, as presented in the [Diffusion Tube Bias Factors Spreadsheet](#) v03_23 (Figure C.1), is 0.83 based on 27 studies.

Figure C.1 – Diffusion Tube Bias Adjustment Factors Spreadsheet

National Diffusion Tube Bias Adjustment Factor Spreadsheet							Spreadsheet Version Number: 03/23				
Follow the steps below in the correct order to show the results of relevant co-location studies							This spreadsheet will be updated at the end of June 2023				
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.											
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 ² 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.		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 ²	Year ³	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m ³)	Automated Monitor Mean Conc. (Cm) (µg/m ³)	Bias (B)	Tube Precision ⁵	Bias Adjustment Factor (A) (Cm/Dm)	
Gradko	20% TEA in water	2022	R	Blackburn With Darwen Bc	12	26	13	35.0%	G	0.74	
Gradko	20% TEA in water	2022	R	Gedling Borough Council	12	31	26	19.3%	G	0.83	
Gradko	20% TEA in water	2022	R	Ards And North Down Borough Council	12	33	22	49.4%	G	0.67	
Gradko	20% TEA in water	2022	R	Bath & North East Somerset	12	30	25	19.0%	G	0.84	
Gradko	20% TEA in water	2022	R	Birmingham City Council	11	32	24	36.8%	G	0.73	
Gradko	20% TEA in water	2022	UB	East Devon District Council	12	8	7	23.6%	G	0.81	
Gradko	20% TEA in water	2022	R	Gateshead Council	11	23	20	14.2%	G	0.88	
Gradko	20% TEA in water	2022	R	Gateshead Council	12	23	21	12.7%	G	0.89	
Gradko	20% TEA in water	2022	R	Gateshead Council	12	25	23	10.1%	G	0.91	
Gradko	20% TEA in water	2022	R	Gateshead Council	11	30	23	29.0%	G	0.77	
Gradko	20% TEA in water	2022	R	Gateshead Council	3	31	36	-14.0%	G	1.16	
Gradko	20% TEA in water	2022	R	Lisburn & Castlereagh City Council	12	24	19	23.7%	G	0.81	
Gradko	20% TEA in water	2022	R	Monmouthshire County Council	12	35	28	23.8%	G	0.81	
Gradko	20% TEA in water	2022	KS	Marylebone Road Intercomparison	12	52	42	22.8%	G	0.81	
Gradko	20% TEA in water	2022	UB	Plymouth City Council	12	18	16	3.2%	G	0.97	
Gradko	20% TEA in water	2022	UC	Belfast City Council	12	26	20	30.7%	G	0.76	
Gradko	20% TEA in water	2022	R	Belfast City Council	12	47	36	28.1%	G	0.78	
Gradko	20% TEA in water	2022	R	Belfast City Council	12	25	22	14.0%	G	0.88	
Gradko	20% TEA in water	2022	R	Belfast City Council	12	36	28	29.0%	G	0.78	
Gradko	20% TEA in water	2022	R	Brighton & Hove City Council	10	37	23	62.8%	G	0.61	
Gradko	20% TEA in water	2022	UB	Hartlepool Borough Council	12	16	15	7.1%	G	0.93	
Gradko	20% TEA in water	2022	R	Southampton City Council	12	36	28	30.6%	G	0.77	
Gradko	20% TEA in water	2022	UC	Southampton City Council	12	28	24	15.4%	G	0.87	
Gradko	20% TEA in water	2022	R	Southampton City Council	12	34	31	8.4%	G	0.92	
Gradko	20% TEA in water	2022	R	Worcestershires	11	13	12	4.2%	G	0.96	
Gradko	20% TEA in water	2022	R	Leicester City Council	13	34	27	25.8%	G	0.79	
Gradko	20% TEA in water	2022	R	Leicester City Council	12	28	24	15.2%	G	0.87	
Gradko	20% TEA in water	2022		Overall Factor² (27 studies)					Use	0.83	

Table C.2 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	03/23	0.83
2021	National	06/22	0.84
2020	National	06/21	0.81
2019	National	03/20	0.93
2018	National	03/19	0.93

NO₂ Fall-off with Distance from the Road

No diffusion tube NO₂ monitoring locations within Pembrokeshire County Council required distance correction during 2022.

QA/QC of Automatic Monitoring

The Narberth automatic monitoring location is part of the Automatic Urban and Rural Network (AURN). The Council carries out LSO duties, including calibration, in accordance with the AURN standards. Site audits and maintenance are provided by Ricardo E&E.

PM₁₀ and PM_{2.5} Monitoring Adjustment

The type of PM₁₀ monitor utilised within Pembrokeshire County Council does not require the application of a correction factor.

Automatic Monitoring Annualisation

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

NO₂ Fall-off with Distance from the Road

No automatic NO₂ monitoring locations within Pembrokeshire County Council required distance correction during 2022.

Appendix D: AQMA Boundary Maps

Figure D.1 – Map of the Haverfordwest AQMA Boundary

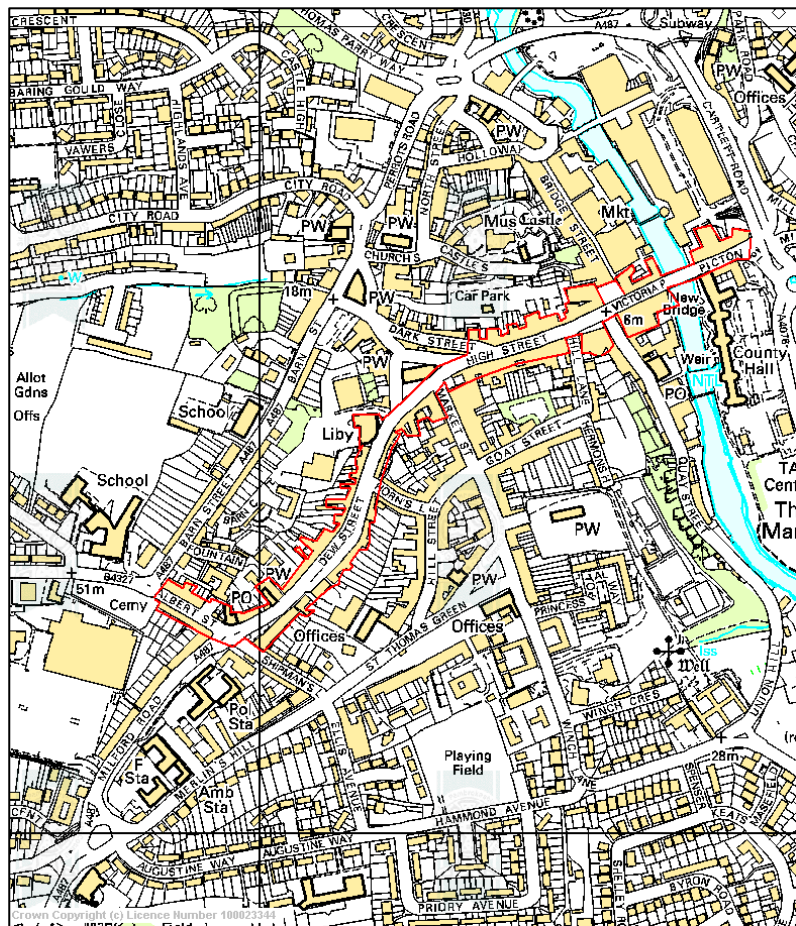
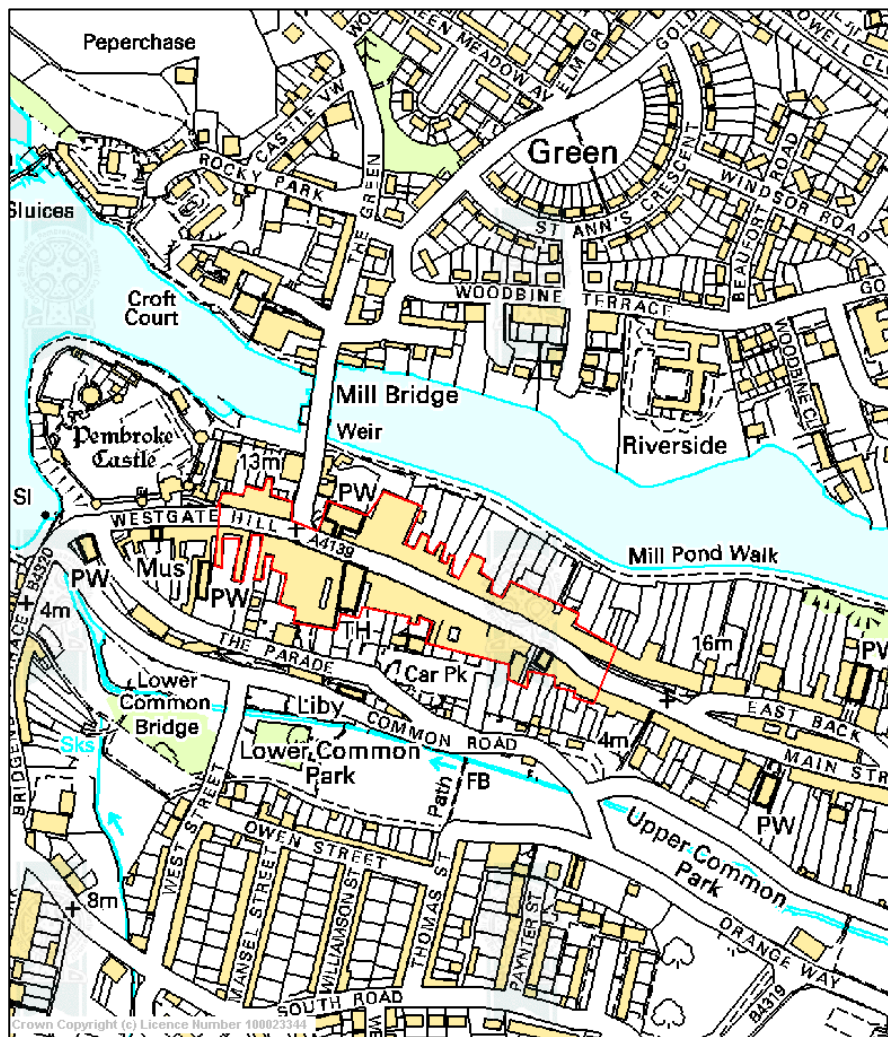


Figure D.2 – Map of the Pembroke AQMA Boundary



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
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
AQS	Air Quality Standard
PCC	Pembrokeshire County Council
PNZC	Pembroke Net Zero Centre