Cyngor Castell-nedd Port Talbot
Neath Port Talbot Council

Neath Port Talbot County Borough Council 2024 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: October 2024

Customer:
Neath Port Talbot County Borough Council

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NPT's 2024 Annual Progress Report (Air Quality)

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Executive Summary: Air Quality in Our Area

Air Quality in Neath Port Talbot County Borough Council

The main air quality issues in Neath Port Talbot (NPT) are:

1. Particulate matter (PM_{10}) in Port Talbot.

Emissions of PM_{10} are associated with emissions from the steel works, which is regulated by Natural Resources Wales (NRW). Since the declaration of the Taibach Margam Air Quality Management Area (AQMA) in 2000, annual average PM_{10} concentrations have generally remained well below regulatory limits. However, the frequency of daily average spikes in pollution concentrations have increased at some sites, and in 2023 the Daily Average PM_{10} standard was exceeded at Prince Street 2 site. Therefore, it is not yet considered to be safe to revoke the air quality management area (AQMA). The Council works with the Welsh Government, Tata and Natural Resources Wales (the regulator) in order to manage air quality issues.

2. Large particulates (nuisance dust) fallout in Port Talbot

Within Port Talbot, nuisance dust is a recurring air quality issue and is also related to activities at the steel works. Although there are no regulatory limits for grit and dust emissions, the concentrations measured at Port Talbot often exceed the guideline "nuisance limit". Neath Port Talbot Council work closely with Tata to monitor and reduce dust affecting residents.

3. Polyaromatic hydrocarbons (PAH) in Port Talbot

Polycyclic aromatic hydrocarbons (PAHs) are a class of chemicals that occur naturally in coal, crude oil, and gasoline. Emissions of PAHs in Port Talbot are associated with the coke ovens used in the steel works. More on this can be found in the '*Technical report on UK supplementary modelling assessment under the Air Quality Standards Regulations 2010 for 2020',* available online. The regulator (NRW) is working with Tata to address the issue. Since measurements commenced in 1999, concentrations of PAHs have varied and remain above the Air Quality Standards Objective of 0.25 ng m^{-3}. In 2023, the EU Target Value for Benzo[a]pyrene in Ambient Air (1 ng m^{-3}) was exceeded at Margam Youth Centre.

4. Nickel in Pontardawe.

The main source of raised nickel levels in Pontardawe is believed to be the Wall Colmonoy works, which is regulated by the Council. The concentrations of Nickel measured in 2023 met regulatory limits however this has not always been the case in previous years.

Actions to Improve Air Quality

The principal actions in the Taibach Margam AQMA Air Quality Action Plan are described in the NRW dust action plan. These are specific actions agreed between the regulator and Tata to reduce pollution from the steelworks.

In addition to working with Tata and NRW, NPT Council also works with Welsh Government and other organisations to better understand and combat pollution from the works.

The Council is the regulator of Wall Colmonoy in Pontardawe which is believed to be the principal contributor to nickel levels in the area. The Council works with the operator to ensure that the business is operated using Best Available Techniques (BAT). The aim is to minimise emissions. The Council also works with Welsh Government and other process operators in the region with this aim in mind.

The Council are in the process of reviewing their Air Quality Action Plan and the updated plan is due to be published in 2024/25.

Local Priorities and Challenges

The Council will continue to work with NRW, Tata and the Welsh Government to understand and minimise particulate emissions from the steelworks. The Council will also continue to focus on regulation of Wall Colmonoy in Pontardawe to maintain measured nickel concentrations below the EU Target.

In both cases above, the main challenge is to understand the precise sources of emissions of which there are potentially several at each location.

How to Get Involved

The public can engage with NPT Council via their website which contains further local information on NPT's Air Quality Strategy, the Council's strategic policy for achieving cleaner air in partnership with the whole community.

Data from the automatic (continuous) air quality monitors located across the County Borough can be found on the Welsh Air Quality Website.

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1 Actions to Improve Air Quality

1.1 Previous Work in Relation to Air Quality

A summary of the reports produced on air quality by NPT County Borough Council to date are detailed below:

1998 *Annual Progress Report* summarising routine measurements.

1999 *Annual Progress Report* summarising routine measurements.

2000 *Annual Progress Report* summarising routine measurements and Review and Assessment of Air Quality, concluding that it would be necessary to declare an Air Quality Management Area (AQMA) for particulate matter (PM_{10}) in Port Talbot. This was due the predicted failure to achieve the Government's Air Quality Objective for PM_{10} by the deadline of 31st December 2004 without intervention.

2001 *Annual Progress Report* summarising routine measurements.

2002 *Annual Progress Report* summarising routine measurements.

2003 *Annual Progress Report* and *Updating and Screening Assessment* produced showing that there was no need to proceed to a detailed assessment in respect of all but two pollutants, nitrogen dioxide (NO_2) and PM_{10}. NO_2 measurements at Victoria Gardens, Neath had shown some increases that merited further investigation. PM_{10} measurements at Port Talbot had continued to require further measurement, especially as improvements to a blast furnace might have been expected to abate emissions somewhat.

2004 *Annual Progress Report* and *Updating and Screening Assessment* produced for NO_2 and PM_{10}, showing that it would not be necessary to declare an AQMA in the vicinity of Victoria Gardens. PM_{10} concentrations were found to increase following re-commissioning of blast furnace number 5 at the steelworks. However, the numbers of exceedances were not as numerous as those recorded prior to the re-build of the furnace and the incorporation of cast house fume arrestment.

2005 *Annual Progress Report* summarising routine measurements.

2006 *Annual Progress Report* and *Updating and Screening Assessment* produced showing that it would be necessary to proceed to a Detailed Assessment in respect of NO_2. Several busy roads were identified for which accurate speed information was not

available. Therefore, it would be necessary to deploy diffusion tubes to assess nitrogen dioxide levels at these locations. Measurements of PM_{10} would continue as before.

2007 *Annual Progress Report* and *Updating and Screening Assessment* produced for NO_2, showing that none of the 19 roadside sites identified in the 2006 USA breached the annual average Air Quality Objective. However, two sites were close to the Objective and one site, Water Street, Port Talbot was at risk of exceeding. Diffusion tube monitoring continued at these locations.

2008 *Annual Progress Report* summarising routine measurements.

2009 *Updating and Screening Assessment* produced, identifying the need to proceed to a Detailed Assessment of NO_2 in respect of Water Street, Port Talbot. Further sites were also identified for deployment of NO_2 diffusion tubes. The daily averaged Air Quality Objective for PM_{10} was not exceeded in Port Talbot.

2010 *Annual Progress Report* and *Updating and Screening Assessment* produced, showing that Air Quality Objectives were not breached at Water Street, but identifying the need to proceed to a Detailed Assessment of NO_2 in respect of sites at: Swansea Road, Pontardawe; Victoria Gardens, Neath and Water Street, Port Talbot.

2011 *Annual Progress Report* and *Detailed Assessment* produced, showing that following improved traffic management and reducing volumes of traffic meant that there were no further problems at Water Street, but confirmed raised levels at Swansea Road, Pontardawe and Victoria Gardens, Neath. The Council committed to deploy continuous NO_2 analysers at these locations.

2012 *Updating and Screening Assessment* produced, identifying the need to proceed to a Detailed Assessment of NO_2 at Swansea Road, Pontardawe and Victoria Gardens, Neath. The report also identified the need to proceed to a Detailed Assessment for PM_{10} at respect of Prince Street, Margam.

2013 *Annual Progress Report* produced, identifying a breach of the short-term air quality objective for PM_{10} at Prince Street in Port Talbot using equipment owned by Natural Resources Wales (NRW). A new monitor was to be installed in 2014 to replace the NRW device, which was relocated. Consequently, the report identified the need to proceed to a Detailed Assessment for PM_{10} at respect of Prince Street, Margam. A *Detailed Assessment* of NO_2 was subsequently produced in 2013, showing that neither air quality objective was breached at Victoria Gardens in Neath. However, a property at 1 Victoria Gardens (39.8 µg m^{-3}) was close to exceeding the short-term Air Quality Objective (AQO).

2014 *Annual Progress Report* summarising routine measurements.

2015 *Annual Progress Report* and *Updating and Screening Assessment* produced, identifying the need to proceed to a Detailed Assessment of NO_2 at Swansea Road, Pontardawe and Victoria Gardens, Neath. A *Detailed Assessment* of PM_{10} was subsequently produced in 2015, examining data from eight sites in Port Talbot, but none were found to breach air quality objectives. Results at Prince Street were more in line with those at Port Talbot Fire Station.

2016 Annual Progress Report and Updating and Screening Assessment produced, identifying the need to proceed to a Detailed Assessment of NO_2 at Victoria Gardens, Neath. A *Detailed Assessment* of NO_2 was subsequently produced in 2016, recommending the deployment of diffusion tubes in triplicate at 1, Victoria Gardens.

2017 *Annual Progress Report* produced, reporting the closure of the continuous NO_2 analyser at Pontardawe, on account of the reduction in pollution levels at the Fire Station site. The NO_2 air quality objective was not exceeded at any location.

2018 *Annual Progress Report* produced, once again reporting a decreasing trend for NO_2 levels at Victoria Gardens and no exceedances of the air quality objectives at any location.

2019 *Annual Progress Report* summarising routine measurements.

2020 *Annual Progress Report* produced, no exceedances of the AQOs were reported at any location apart from for Polyaromatic Hydrocarbons and Nickel. The Polyaromatic Hydrocarbons exceed the Air Quality Objective but not the EU target. Nickel only exceeded the EU Target at 1 location, Tawe Terrace. NO_2 levels at the continuous monitor at Victoria Gardens also continued to fall.

2021 *Annual Progress Report* produced, no exceedances of the AQOs were reported at any location apart from for Polyaromatic Hydrocarbons and Nickel. The Polyaromatic Hydrocarbons exceed the Air Quality Objective but not the EU target. Nickel only exceeded the EU Target at 1 location, Tawe Terrace.

2022 *Annual Progress Report* produced, no exceedances of the AQOs were reported, except for Polyaromatic Hydrocarbons and Nickel. The Polyaromatic Hydrocarbons exceed the Air Quality Objective but not the EU target. Nickel only exceeded the EU Target at 1 location, Tawe Terrace.

2023 *Annual Progress Report* produced, the Daily Average PM_{10} standard was exceeded at Prince Street 2 and Polyaromatic Hydrocarbons and Nickel also exceeded. The

Polyaromatic Hydrocarbons exceeded both the Air Quality Objective and EU target. Nickel only exceeded the EU Target at 1 location, Tawe Terrace.

1.2 Air Quality Management Areas

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

A summary of the AQMA declared by NPT Council can be found in Table 1.1. The table presents a description of the AQMA that is currently declared in response to exceedances of the PM_{10} 24-hour mean objective. The AQMA boundary can be seen in Appendix D.

Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available on the Defra website.

Table 1.1 – Declared Air Quality Management Areas

AQMA	Relevant Air Quality Objective(s)	Comments on Air Quality Trend	Town	Description	Action Plan
AQMA Taibach/ Margam	Particulate Matter PM_{10} 24-hour mean	There has been a gradual decrease in PM_{10} exceedance days since the declaration of the AQMA	Neath Port Talbot	An area covering the majority of land and properties between the Corus Steel Works and the M4 Motorway.	Air Quality Action Plan for the Taibach Margam Air Quality Management Area – 2012

Due to ongoing compliance with the Air Quality Objectives within the AQMA, during 2023 NPT considered whether it should revoke the declaration. It was decided that the AQMA should not be revoked at this time. It is considered important that the AQMA remains in place for at least a short period longer for the following reasons:

1. To allow for a period of post-Covid air quality monitoring, to establish any impact that Covid had on the pollution levels and to see if long term changes in working practices has an impact on the AQMA.
2. A period of monitoring to allow investigation into the impact that the reduced M4 speed limit has had on the AQMA.

3. Completion of the Vortex Air Quality Monitoring Pilot Study that aims to more effectively target interventions, identify particular pollution hotspots and sources that were previously hidden, and gain a better understanding of the impact of particular policies; crucial to designing effective strategies for managing air pollution. Further information is available on our website.
4. Considerations of any new requirements imposed by the Clean Air Bill which is scheduled for introduction during the second year of this Senedd term[1].
5. Noted increases in days exceeding the daily PM_{10} concentration limit at PT2 Margam monitoring site in 2021 through to 2023, with 2023 in particular exceeding the AQO for daily mean PM_{10}.

[1] https://www.gov.wales/written-statement-publication-white-paper-clean-air-wales-bill-summary-responses

1.3 Implementation of Action Plans

NPT has taken forward a number of measures during 2023 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.

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

NPT has recently published an updated draft AQAP for 2024 to 2029 - Neath Port Talbot County Borough Council Air Quality Action Plan 2024 - 2029. The draft action plan will shortly be sent out for public and statutory consultation after which it will be formally adopted. The AQAP works closely alongside the Short Term Action Plan (STAP) which is also under review and likely to have a significant influence on the measures that NPT adopt in their new AQAP.

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
A1	Multi-agency interaction	Cooperation between various organisations to investigate PM10 exceedances	Welsh Government	2000	2001-present	See previous Progress reports	Impossible to quantify	Various investigations, most recently the King's College monitoring report	In 2021 the STAP data team was reconvened and a review of outstanding actions was completed. A review of the STAP was commenced and the data team proposed a new action plan for the group. Council received funding to review their input into the STAP data team, including the method for breach day investigations. The new format is used to better pinpoint sources of PM10, this has been agreed with the group and implemented. Following this year's breach of the AQO investigations have extended to include Prince Street monitor	Not known	Impossible to quantify
A2	Dust reduction programme at Tata site	Reduce particulate emissions via NRW regulation	NRW	2000	2001-present	Implementation of various improvement schemes	Impossible to quantify	Various improvements. See previous Progress reports.	Dust specific meetings commenced between NPT and Tata to share data and an action plan was produced. The meetings continued through 2023. Research was done into whether Council sampling could be used to further pinpoint sources of dust, this work is ongoing.	None. The dust reduction programme will continue for the foreseeable future	Impossible to quantify
A3	Planning policies	Resist developments on air quality grounds where appropriate	NPT	2000	2001-present	None	Impossible to quantify	LDP now in force	The current adopted LDP (2011-2026) contains policies that would resist proposals that would have an unacceptable adverse effect on health, biodiversity, local amenity or would expose people to unacceptable risk when considering pollution and land stability, including air quality. The LDP is monitored each year within the Annual Monitoring Report, which contains an indictor to monitor planning applications permitted within the AQMA. Work is currently progressing on the Replacement Local Development Plan (2023-2038), with adoption date anticipated to be Spring 2027. The first statutory stage of the process, consultation on the Preferred Strategy is scheduled for December 2024. The Preferred Strategy will identify the key issues and objectives for the plan to address, which will include the need to address all types of pollution including air quality.	LDP complete	Impossible to quantify
A4	Tree planting	Trees may help to reduce airborne particulates	Tata, NRW, NPT	N/A	Ongoing	Number of trees and shrubs planted	Impossible to quantify	Tree planting in Port Talbot	Pilot project completed	Not known	Impossible to quantify
A5	Transport infrastructure (PDR)	Provide alternative route for traffic and slightly reduce pollution	NPT	2010	Completed 2013	None	Impossible to quantify	PDR complete	PDR complete	PDR complete	Impossible to quantify
A6	Train haulage emissions	Investigate cases of visible mineral emissions from trains	NPT	N/A	Ongoing	Avoidance of visible emissions	Impossible to quantify	No problems in recent years	No problems in recent years	Ongoing	Impossible to quantify
A7	NPT regulated activities	Regulate Civil & Marine slag cement to minimise PM10 emissions	NPT	N/A	Ongoing	Compliance with permit	Impossible to quantify	Emissions comply with permit	No compliance issues in 2023	Ongoing	Impossible to quantify
A8	Travel plans	Minimise traffic and emissions by use of public transport etc.	NPT	N/A	Ongoing	Travel plan implemented	Impossible to quantify	Part implemented but not complete	Funding received for local bus provision.	Local Bus contracts secured until 2028	Impossible to quantify

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
A9	School travel plans	Reduce the impact of the school journey in the AQMA	NPT	N/A	Ongoing	Number of plans in place	Impossible to quantify	61 plans in place	4 new plans	Ongoing	Impossible to quantify
A10	Domestic bonfires	Minimise through education and recycling	NPT	N/A	Ongoing	Provision of green waste recycling	Impossible to quantify	Quantities vary from year to year depending on weather etc	Responded to 196domestic smoke and bonfire complaints between Jan and Dec 2023.42,870 tonnes of recycling - combination of reuse, recycling and composting in 2021.	Ongoing	Impossible to quantify
A11	Industrial fires	Minimise large industrial fires by identifying risky sites and taking remedial action	NPT, NRW	N/A	Ongoing	Avoidance of industrial fires in Port Talbot	Impossible to quantify	No problems in recent years	27 business/ industrial smoke complaints received	Ongoing	Impossible to quantify
A12	Hill fires	Prevent hill fires in vicinity of Port Talbot	MAWWFIRE	N/A	Ongoing	Minimise hill fires through education	Impossible to quantify	Community Fire Safety Team targets schools and farmers	Fire and Rescue responded to 40 hill fires in and around the Port Talbot area in 2021.This is 17 more than the year before.	Ongoing	Impossible to quantify
A13	Street sweeping	Can be carried out as required to remove particulates from the highway	NPT	N/A	Ongoing as required	The cleanliness of the street scene	Impossible to quantify	Sweeping has been carried out at Tata's request on several occasions	Sweeping carried out on PDR at Tata's request as and when required	Ongoing	Impossible to quantify
A14	Air Alerts	Provide email alert system notifying NRW, WG, Tata etc. to intervene where pollution levels are raised	NPT	N/A	Ongoing	System operates as expected	Impossible to quantify	System has been operational for some years	151 users currently subscribed	Ongoing	Impossible to quantify

2 Air Quality Monitoring Data and Comparison with Air Quality Objectives

This section sets out the monitoring undertaken in 2023 by Neath Port Talbot Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2019 and 2023 to allow monitoring trends to be identified and discussed.

2.1 Summary of Monitoring Undertaken in 2023

2.1.1 Automatic Monitoring Sites

NPT Council undertook automatic (continuous) monitoring at five sites during 2023. Table 2-1 presents the details of the sites. National monitoring results are available on the Welsh Air Quality Website. The council has a comprehensive monitoring network that it has operated for many years, providing high quality air quality data for the area and particularly around Port Talbot's Steelworks and the AQMA.

Monitoring at Prince Street, Little Warren and Dyffryn School were upgraded from FDMS (Filter Dynamics Measurement System) to BAMs (Beta Attenuation Monitor) to allow sampling for PM_{10} and $PM_{2.5}$. In 2022, Twll yn y Wal (TYW) developed a fault at the same time as a number of other monitors. When the sites were reviewed it was concluded that TYW was lower priority than others for replacement because it had not shown any exceedances for a number of years and as such monitoring is no longer conducted at this site.

Maps showing the location of the monitoring sites are provided in Figure 2.1. 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-Automatic Monitoring Sites

NPT undertook non-automatic (passive) monitoring of NO_2 at 20 sites during 2023. Table 2.2 presents the details of the sites. Maps showing the location of the monitoring sites are provided in Figure 2.2. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

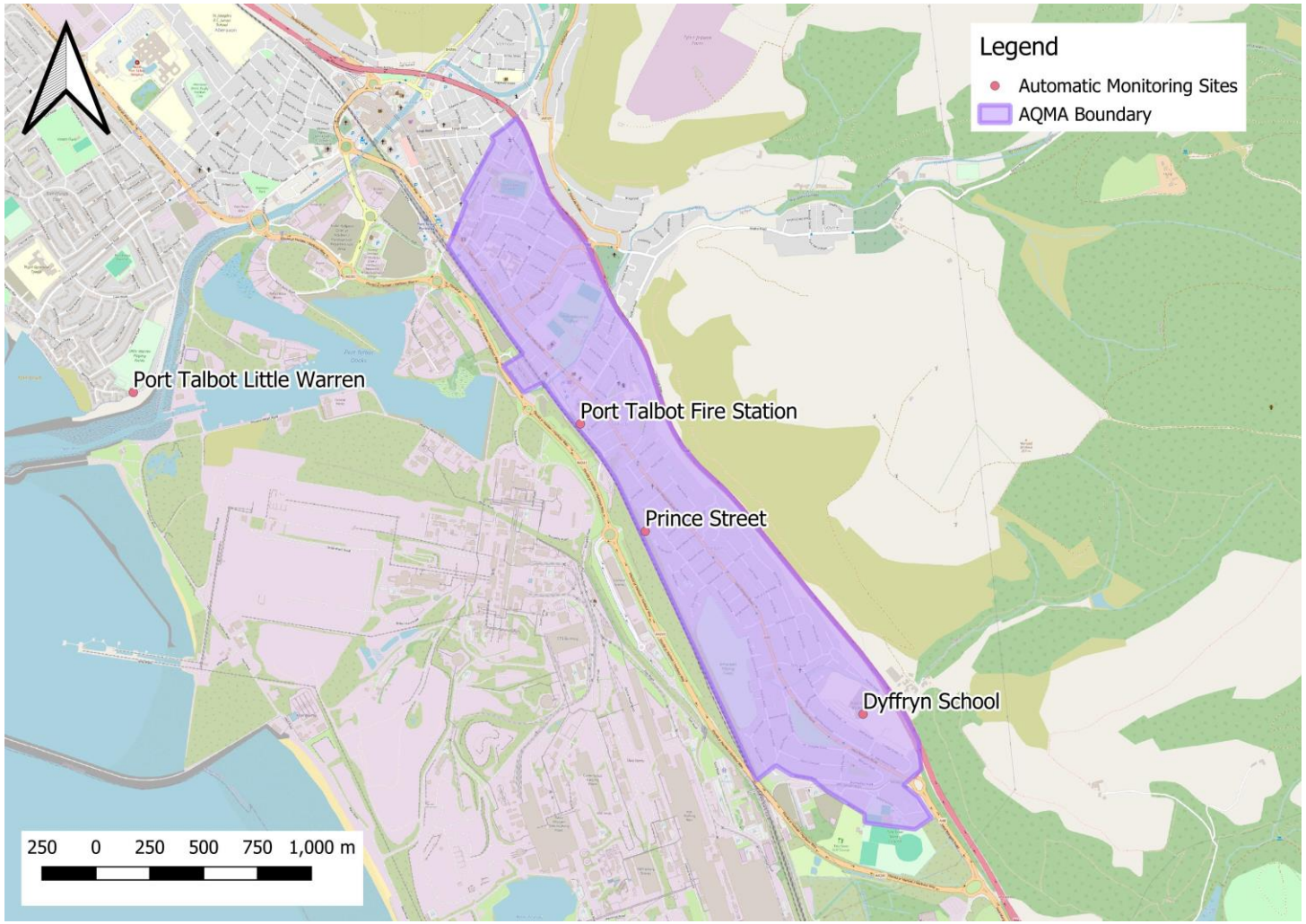
Table 2-1 – Details of Automatic Monitoring Sites

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)
PT2	Port Talbot Margam (Fire Station) AURN	Industrial	Y (Taibach Margam)	277388	188733	PM_{10}, $PM_{2.5}$, SO_2, CO, O3, NO_2	BAM, UV fluorescence, IR absorption, UV absorption, chemiluminescence	2.5	16	8	4
DS1	Dyffryn School	Industrial	Y (Taibach Margam)	278700	187387	PM_{10}, $PM_{2.5}$	BAM	1.8	45	4	45
LW1	Talbot Little Warren	Industrial	N	275313	188879	PM_{10}, $PM_{2.5}$	BAM	2.5	35	7	53
PS2	Prince Street	Industrial	Y (Taibach Margam)	277689	188235	PM_{10}, $PM_{2.5}$	BAM	1.8	45	6	57
VG2	Victoria Gardens	Roadside	N	275471	197183	NO_2	Chemiluminescence	1.2	18	19	2

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



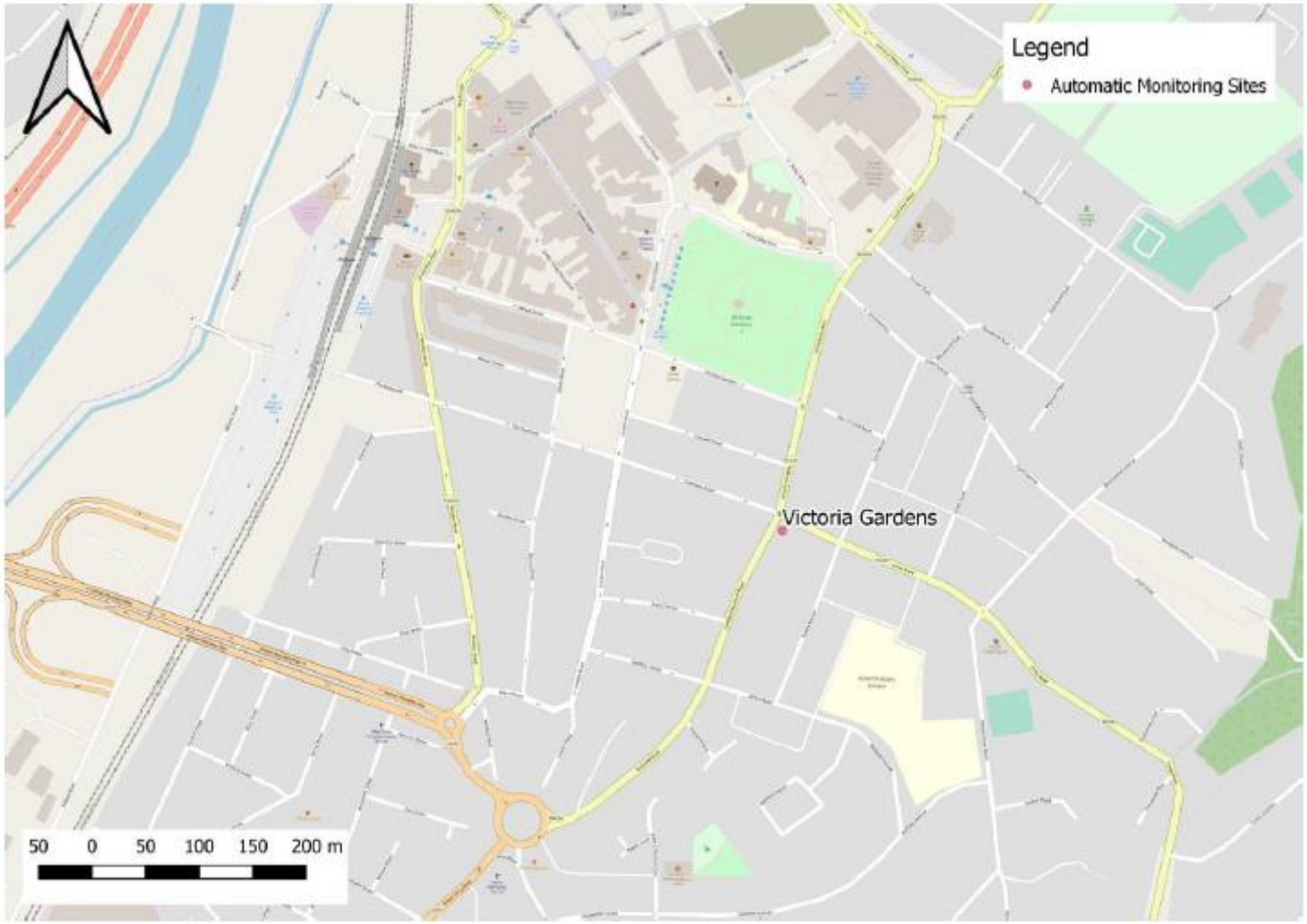

Legend
Automatic Monitoring Sites
Victoria Gardens
50 0 50 100 150 200 m

Table 2.2 – Details of Non-Automatic Monitoring Sites

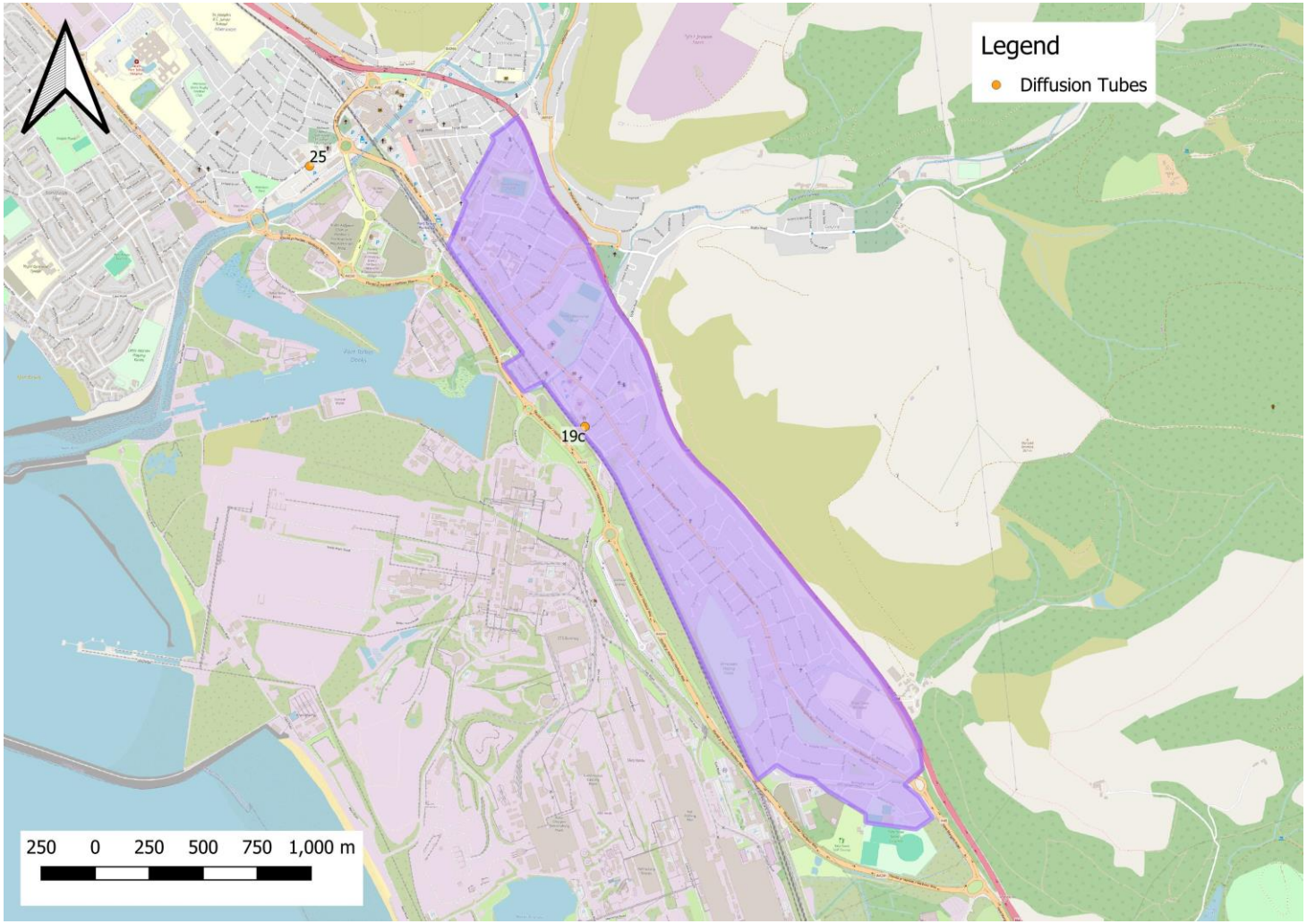
Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
1a, 1b, 1c	1 VG (Tube A), (Tube B), (Tube C)	Roadside	No	275463	197217	2	No	0	1	1
5	Eastland Rd. Neath (28 Eastland Rd)	Roadside	No	275438	197164	1.5	No	0	4	4
8	Neath Rd. Briton Ferry (Tube 185)	Roadside	No	274307	194580	2	No	0	2	2
9	Neath Rd. Briton Ferry (Tube 179)	Roadside	No	274305	194563	2	No	0	2	2
10	Neath Rd. Briton Ferry (Tube 187)	Roadside	No	274308	194584	2	No	0	2	2
11	Neath Rd. Briton Ferry (Tube 183)	Roadside	No	274310	194589	2	No	0	2	2
13	Eastland Rd. Neath (40 Eastland Rd)	Roadside	No	275415	197110	1.5	No	0	4	4
14	Eastland Rd. Neath (32 Eastland Rd)	Roadside	No	275431	197149	1.5	No	0	4	4
15	Eastland Rd. Neath (30 Eastland Rd)	Roadside	No	275434	197157	1.5	No	0	4	4
17	1 Greenway Rd. Neath	Roadside	No	275455	197211	2	No	0	2	2
18a, 18b, 18c	Pontardawe PO (Tube A), (Tube B), (Tube C)	Roadside	No	272034	203954	2	No	0	2	2

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)
19a, 19b, 19c	Port Talbot Fire Station (Tube A), (Tube B), (Tube C)	Industrial	Yes (Taibach/ Margam)	277406	188719	2.5	Yes	16	8	4
20a,	3 VG (Tube A),	Roadside	No	275463	197223	1.5	No	0	3	3
21	50 Greenway Rd. Neath	Roadside	No	275452	197195	2	No	0	2	2
22	54 Windsor Rd. Neath	Roadside	No	275146	197248	2	No	0	2	2
23	4 VG	Roadside	No	275482	197227	1.5	No	0	3	3
24a, 24b, 24c	Stockhams Corner. Neath (Tube A), (Tube B), (Tube C)	Roadside	No	275200	196905	2	No	0	3	3
25	Water St. Port Talbot	Roadside	No	276131	189926	2	No	0	2	2
28	Swansea Rd. Pontardawe (7 Swansea Rd)	Roadside	No	272026	203961	2	No	0	2	2
34a, 34b, 34c	Cimla Rd Analyser. Neath (Tube A), (Tube B), (Tube C)	Roadside	No	275475	197186	1.4	Yes	20	2	2

Notes:

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

Figure 2.2 – Map(s) of Non-Automatic Monitoring Sites




Legend
Diffusion Tubes
22
20c
23
17
1b
34b
5
15
14
13
0
50
100
150
200 m


Legend
Diffusion Tubes
28
18c
50 0 50 100 150 200 m


Legend
Diffusion Tubes
Mansel Street
Vernon Street
Grandison Street
Neath Road
Neath Road
Neath Road
A474
Salem
11
10
8
9
50
0
50
100
150
200 m

2.2 Air Quality Monitoring Results – 2023

2.2.1 Nitrogen Dioxide (NO_2)

There were no exceedances of the annual mean AQS objective for NO_2 (40 µg m^{-3}) at any site, whether measurements were conducted using diffusion tubes or continuous analysers.

In 2023, the maximum annual mean NO_2 concentration at any site was at DT34 (26.4 µg m^{-3}), a slight increase from the maximum concentration measured in 2022 at DT34 (26.3 µg m^{-3}) as shown in Table 2.4 and Figure 2.4. Apart from this site however, all other diffusion tubes recorded a lower annual mean NO_2 concentration than 2022. Annual mean NO_2 concentrations at all sites decreased over the last 5 years, except for a slight increase between 2020 and 2021. It is thought that a greater than expected decrease in concentrations in 2020 is due to the COVID-19 lockdown and restrictions and the subsequent increase in 2021 is due to easing of these restrictions. Concentrations fell by around 5% between 2021 and 2022.

There have been no exceedances of the 1-hour NO_2 AQS objective (200 µg m^{-3}) measured at the automatic monitoring locations (Table 2.5). All automatic monitoring sites had sufficient data capture therefore annualisation was not required.

Diffusion tube data has been subject to bias adjustment and the calculation methodology is included in Appendix C: Air Quality Monitoring Data QA/QC. A local bias adjustment of 0.66 was used. The full dataset is included as Appendix A: Quality Assurance / Quality Control (QA/QC) Data. Annualisation was necessary for six sites (DT8, DT9, DT10, DT11, DT14 and DT23). Annualisation was required at the majority of these sites as diffusion tube data from the period 06/12/2023 – 31/01/2024 was discounted as the tubes were exposed longer than the 2-6 weeks recommended by the LAQM.TG(22) and was therefore potentially unreliable. The methodology was confirmed with the LAQM help desk. Furthermore, the data was outside of the annualisation period of a year and so the Diffusion Tube Data Processing Tool was unable to calculate annualisation.

Table 2.3 – Annual Mean NO_2 Monitoring Results for Automatic Stations (µg/m^3)

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
PT2	Industrial	Automatic	94.6	94.6	15.0	12.0	13.0	12.0	11.0
VG2	Roadside	Automatic	95.6	95.6	32.0	27.0	26.0	27.0	24.0

Figure 2.3 – Trends in Annual Mean NO_2 Concentrations (Automatic Stations)

Table 2.4 – Annual Mean NO_2 Monitoring Results for Diffusion Tubes (µg/m^3)

Site ID	Site Name	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
1a, 1b, 1c	1 Victoria Gardens (A, B, C)	Roadside	82.6	82.6	34	29.8	32.6	25.7	21.1
5	28 Eastland Road	Roadside	82.6	82.6	27.2	23.9	26.8	20.6	18.6
8	Neath Briton Ferry Road 185	Roadside	72.0	72.0	23.9	21.2	23.7	18.9	17.8
9	Neath Briton Ferry Road 179	Roadside	64.7	64.7	25.1	21.6	22.7	21	17.3
10	Neath Briton Ferry Road 187	Roadside	32.6	32.6	26.1	22.7	21.6	18.9	15.2
11	Neath Briton Ferry Road 183	Roadside	72.0	72.0	26.1	22.6	25.4	18.5	18.0
13	40 Eastland Road	Roadside	75.3	75.3	23.6	20.5	24.4	20.1	17.2
14	32 Eastland Road	Roadside	72.6	72.6	26.6	23	25.5	21.7	17.6
15	30 Eastland Road	Roadside	83.4	83.4	27.1	23.7	26.5	20.2	17.8
17	1 Greenway Neath	Roadside	83.4	83.4	31.3	26	29.5	23.8	19.0
18a, 18b, 18c	Portar Dave (P.O.A, P.O.B, P.O.C)	Roadside	90.8	90.8	36.8	30.3	32.2	24	18.6
19a, 19b, 19c	Port Talbot Fire Station (A, B, C)	Industrial	90.8	90.8	15.7	13.4	15.2	11.8	9.8
20a	3 Victoria Gardens	Roadside	82.6	82.6	29.8	25.9	27.4	22.6	19.4

Site ID	Site Name	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
21	50 Greenway Road	Roadside	90.8	90.8	33.7	32.5	34.8	25.8	20.2
22	54 Winsor Road	Roadside	83.4	83.4	21.3	17.6	21.3	16.1	13.4
23	4 Victoria Gardens	Roadside	42.7	42.7	26.2	22.2	23.3	19.2	15.1
24a, 24b, 24c	Stockham's Corner (A, B, C)	Roadside	83.4	83.4	28	24.8	26	21.3	18.4
25	Water St	Roadside	90.8	90.8	27.7	21.5	26.6	21.2	17.6
28	7 Swansea Road	Roadside	79.9	79.9	24.4	22.7	17.2	18.2	15.4
34a, 34b, 34c	Cimla Road Analyser	Roadside	82.6	82.6	36.6	30	34	26.3	26.4

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☒ **Diffusion tube data has been bias adjusted.**

☒ **Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.**

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.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 2.4 – Trends in Annual Mean NO_2 Concentrations (Diffusion Tubes)

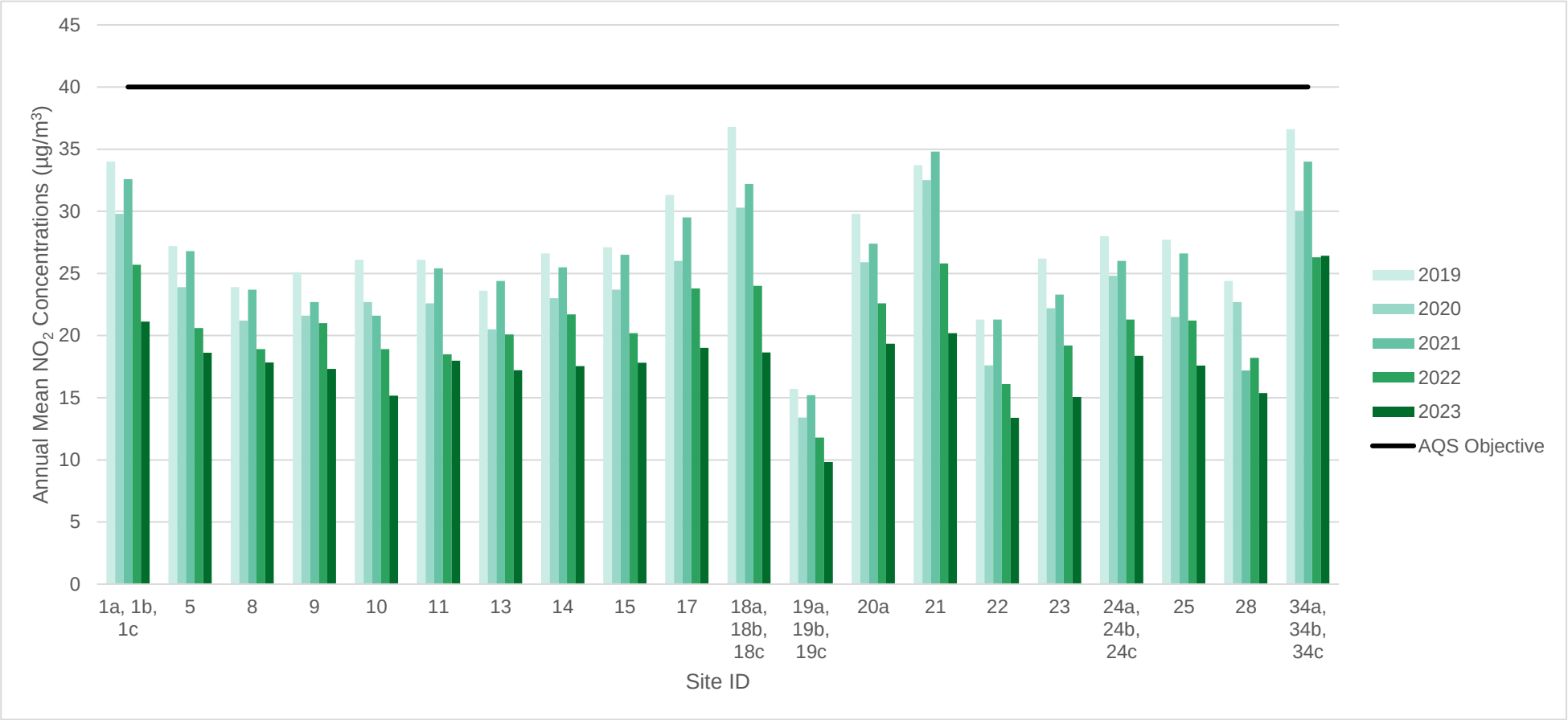


Table 2.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
PT2	Industrial	Automatic	94.6	94.6	0	0	0	0	0
VG2	Roadside	Automatic	95.6	95.6	0	0	0	0 (90)	0

Notes:

Exceedances of the NO_2 1-hour mean objective (200µg/m^3 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%).

2.2.2 Particulate Matter (PM_{10})

In 2023, there were no exceedances of the annual mean AQS objective for PM_{10} (40 µg m^{-3}) at any site. The maximum annual mean PM_{10} concentration at any site was at PS2 (29 µg m^{-3}), an increase from the maximum concentration measured in 2022 at PS2 (27 µg m^{-3}) as shown in Table 2.6 and Figure 2.5. All four sites recorded a higher annual mean PM_{10} concentration than 2022. Annual mean PM_{10} concentrations have remained steady at DS1 and LW1 over the last 5 years, whilst concentrations have increased at PT2 and PS2. It is thought that a greater than expected decrease in concentrations in 2020 is due to the COVID-19 lockdown and restrictions and the subsequent increase in 2021 is due to easing of these restrictions.

In 2023, the number of days at PS2 with a 24-hour mean PM_{10} concentration exceeding 50 µg/m^3 reached 45, as shown in Table 2.7 and Figure 2.6. This exceeds the limit of 35 days in a calendar year. All four sites recorded a higher number of exceedance days than 2022. Whilst still compliant, there was a large increase in the recorded exceedance days at PT2 in 2023 (31) compared to 2022 (23).

Table 2.6 – Annual Mean PM_{10} Monitoring Results (µg/m^3)

Site ID	Site Name	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
PT2	Port Talbot Fire Station	Industrial	92.8	92.8	21	21	25	26	27
DS1	Dyffryn School	Industrial	94.7	94.7	22	23	25	17	19
LW1	Little Warren	Industrial	97.7	97.7	20	21	18	19	21
PS2	Prince Street 2	Industrial	99	99	20	24	20	27	29

Notes:

Exceedances of the PM_{10} annual mean objective of 40µg/m^3 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 2.5 – Trends in Annual Mean PM_{10} Concentrations

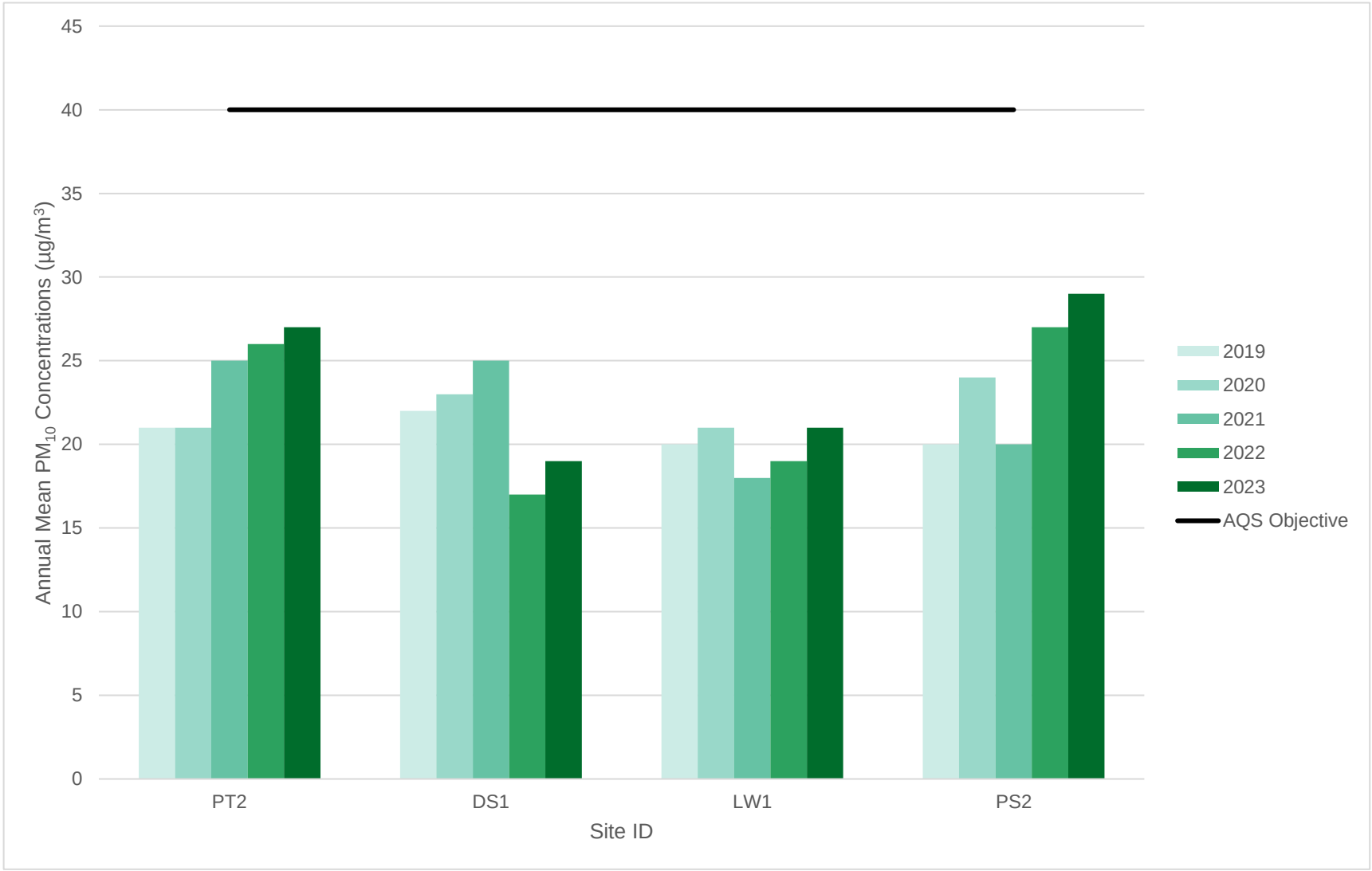


Table 2.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	Site Name	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
PT2	Port Talbot Fire Station	Industrial	92.8	92.8	12	11	33	23	31
DS1	Dyffryn School	Industrial	94.7	94.7	2	0	0	2 (30)	3
LW1	Talbot Little Warren	Industrial	97.7	97.7	9	15	7	6 (33)	9
PS2	Prince Street 2	Industrial	99	99	8	16	3	20 (47)	45

Notes:

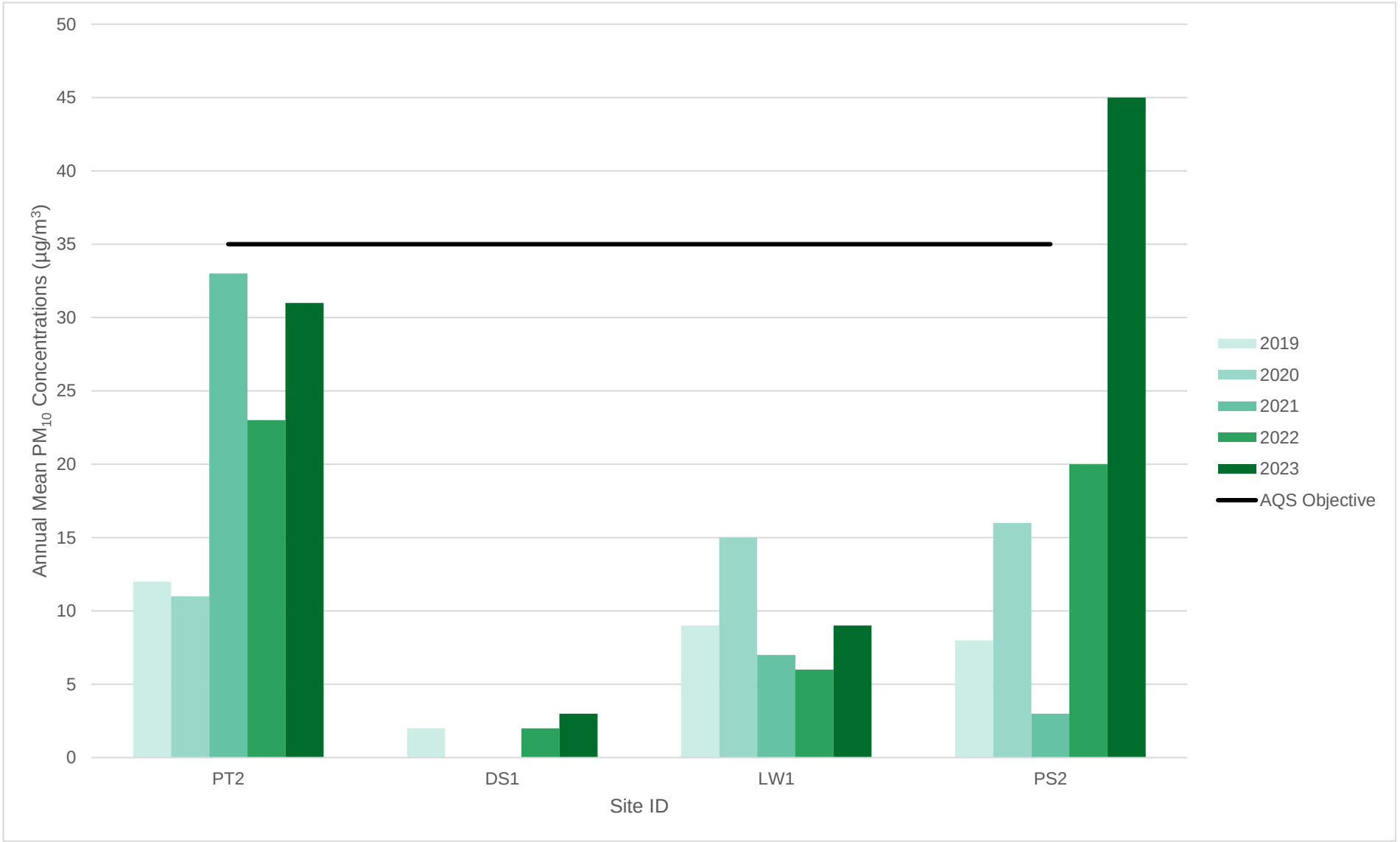
Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times/year) are shown in **bold**.

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%).

Figure 2.6 – Trends in Number of 24-Hour Mean PM_{10} Results > 50µg/m^3



2.2.3 Particulate Matter ($PM_{2.5}$)

In 2023, there were no exceedances of the annual mean WHO target valuefor $PM_{2.5}$ (10 µg m^{-3}) at any site. The maximum annual mean PM_{10} concentration at any site was at PS2 (10 µg m^{-3}), which is the same concentration as 2022 as shown in Table 2.8 and Figure 2.7. Across all four sites, $PM_{2.5}$ have remained stable between 2019 – 2023.

Table 2.8 – $PM_{2.5}$ Monitoring Results (µg/m^3)

Site ID	Site Name	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
PT2	Port Talbot Fire Station	Industrial	95.4	95.4	11	11	9	8	8
DS1	Dyffryn School	Industrial	97	97	-	-	-	6	8
LW1	Little Warren	Industrial	98.2	98.2	-	-	-	7	7
PS2	Prince Street 2	Industrial	99.1	99.1	9	9	9	10	10

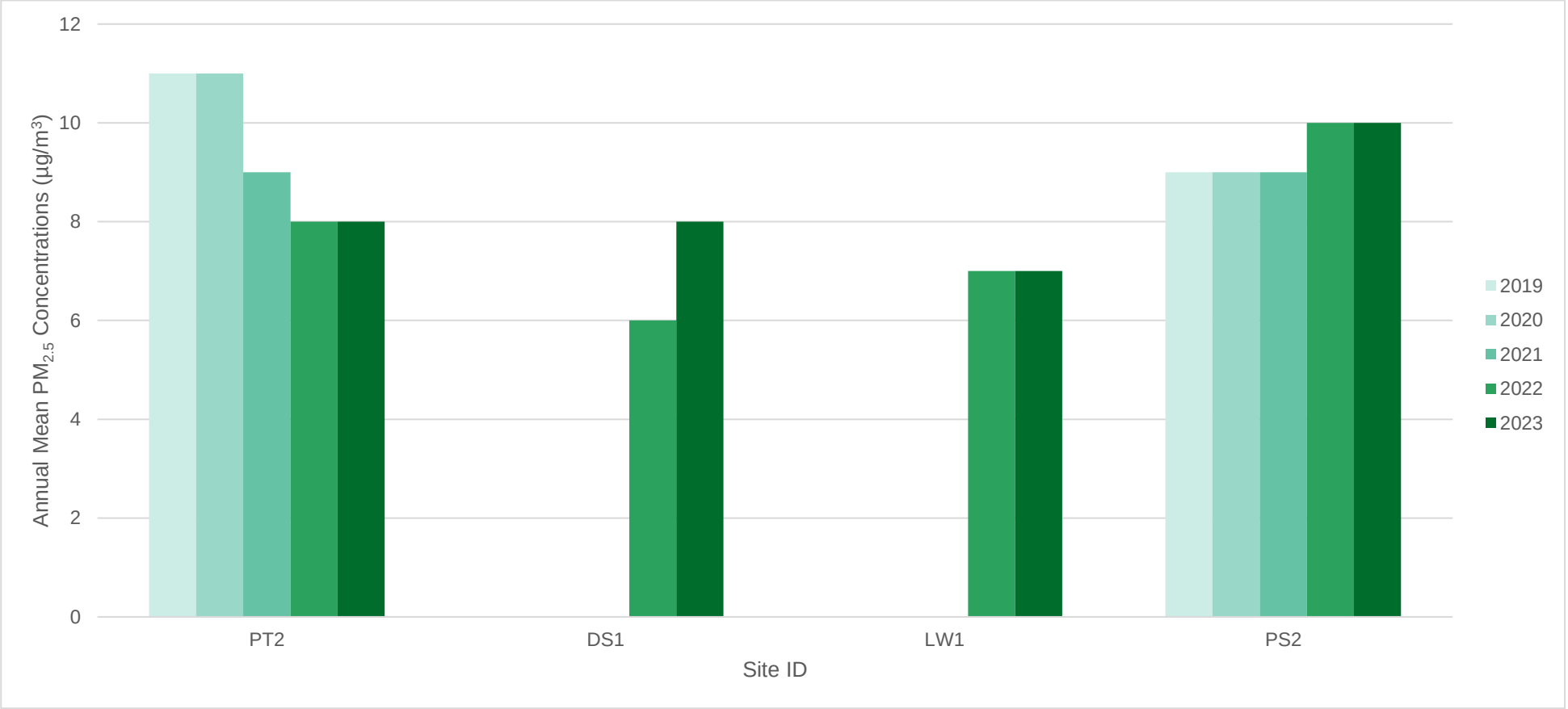
Notes:

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 2.7 – Trends in Annual Mean $PM_{2.5}$ Concentrations



2.2.4 Sulphur Dioxide (SO_2)

During 2023 there were no exceedances of the 15-minute average of 266 µg m^{-3} (up to 35 are allowed annually) for SO_2 concentrations as measured at Port Talbot Fire Station, where the annual data capture rate was 94.5% (Table 2-9). Neither were there any exceedances of the 350 µg m^{-3} (maximum 120 µg m^{-3}) 1-hour mean or the 125 µg m^{-3} daily mean (maximum 40 µg m^{-3}). Measurements are carried out using a Thermo 48i analyser under the QA/QC arrangements of the AURN.

Table 2-9 – SO_2 Monitoring Results (µg m^{-3})

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	Number of: c 15-minute Means > 266 µg m^{-3}	Number of: c 1-hour Means > 350 µg m^{-3}	Number of: c 24-hour Means > 125 µg m^{-3}
PT2	Urban Industrial	Y	94.5	94.5	0	0	0

Notes:

In bold, exceedance of the relevant AQS objective (15-min mean = 35 allowed/year; 1hour mean = 24 allowed/year; 24-hour mean = 3 allowed/year)

(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 six months the maximum data capture for the full calendar year would be 50%)

2.2.5 Carbon Monoxide (CO)

There were no exceedances of the 8-hour maximum daily running average of 10 mg m^{-3} during 2023 (Table 2-10). Measurements are carried out using a Thermo 48i analyser under the QA/QC arrangements of the AURN.

Table 2-10 – CO Monitoring Results (mg m^{-3})

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	Number of Exceedances of 8 hour mean > 10 mg m^{-3}
PT2	Urban Industrial	Y	82.7	82.7	0 (0.99)

Notes:

If the period of valid data is less than 85%, the 98th percentile of 1-hour means is provided in brackets.

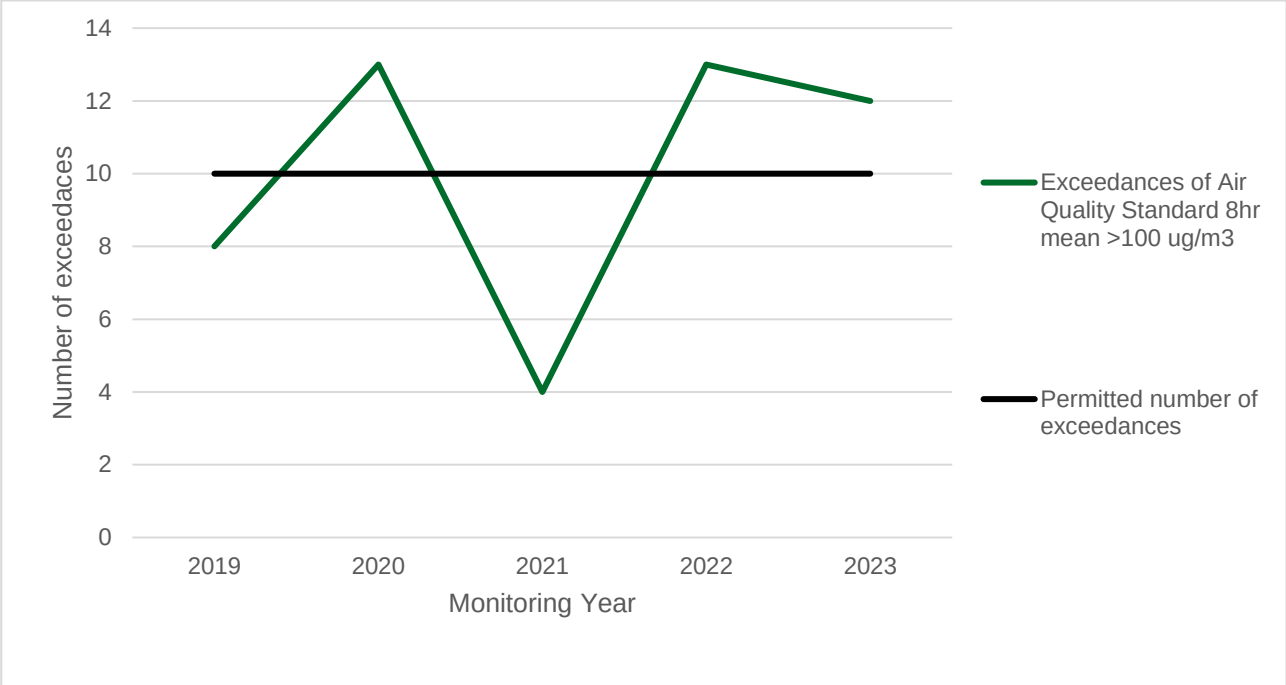
2.2.6 Ozone (O_3)

Ozone (O_3) is a highly reactive chemical which, when present in the lower atmosphere at high concentrations, can irritate the eyes and air passages, causing breathing difficulties.

O_3 is a so-called secondary pollutant as it is produced indirectly by the reaction between hydrocarbons, NO_2 and sunlight. O_3 tends to be lower in urban areas because high levels of NO are produced by vehicles, and this helps to break down O_3 to oxygen and NO_2. The highest concentrations of O_3 therefore tend to occur in rural areas and during the summer months. The O_3 forming reactions are complex and have a time lag associated with them which can mean that O_3 levels are greatest downwind of the location where the pollution is produced. It is recognised that low level O_3 formation is an international problem and that exceedances of the National Air Quality Standard would still occur, even if all sources of hydrocarbons were eliminated in this country.

The Air Quality Standards objective for O_3 is 100 µg m^{-3}, measured as a rolling 8-hour average, which is not to be exceeded more than 10 times a year. The Port Talbot Margam Fire Station site measured concentrations greater than 100 µg m^{-3} on 12 occasions during 2023 (data capture was 96%), exceeding the permitted number. In 2022 and 2023 the number of exceedances were also greater than the permitted number (Figure 2-8).

Figure 2-8 – Number of Exceedances of the Ozone AQS



2.3 Comparison of 2023 Monitoring Results with Previous Years and the Air Quality Objectives

The trend analysis presented in this section has been carried out using Openair: a free, open-source software package of tools for analysis of air pollution data. Openair was initially funded by the Natural Environment Research Council (NERC), with additional funds from Defra[2]. The Openair project is now maintained by Dr David Carslaw, of Ricardo Energy & Environment/ University of York and Dr Karl Ropkins of the University of Leeds.

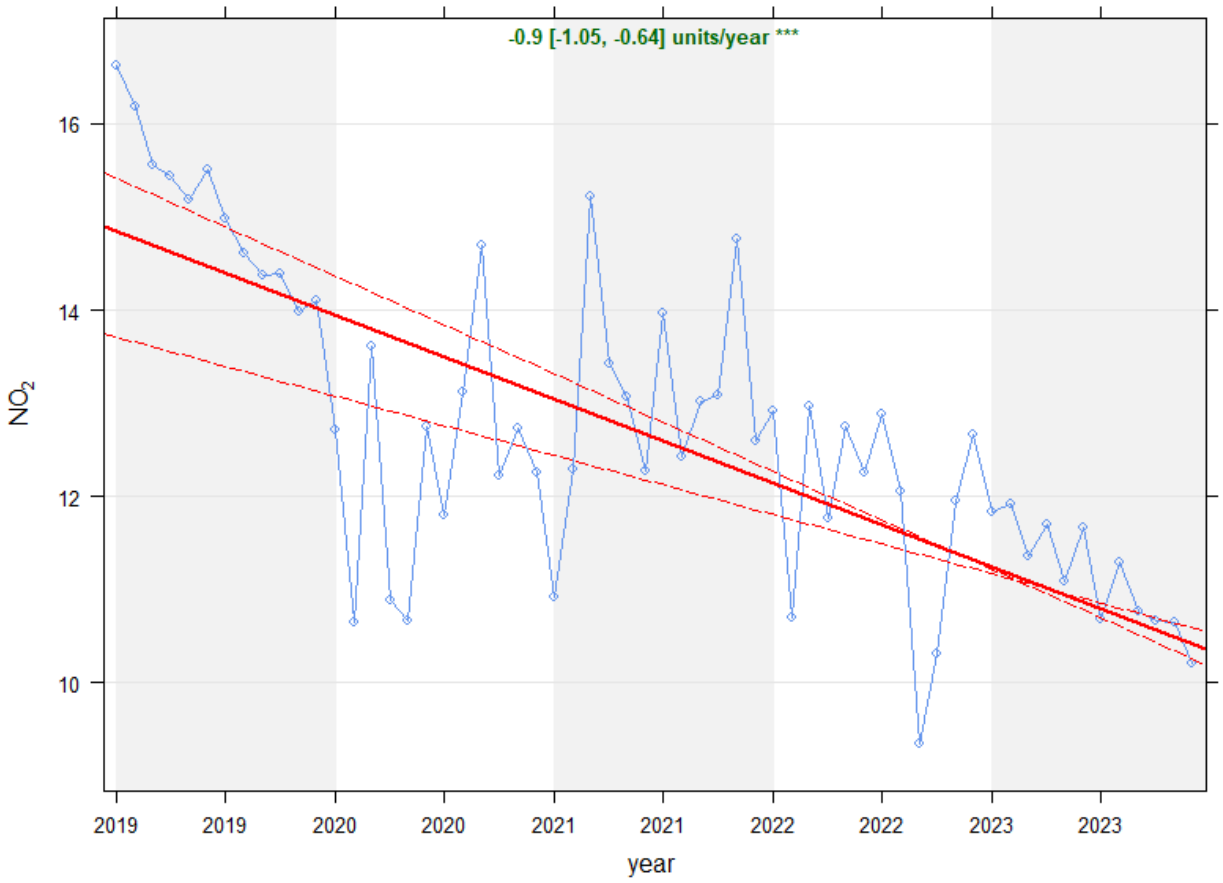
For long-term trend analysis in this section, the Openair "TheilSen" analysis tool was used. This uses the Theil-Sen statistical method to determine trends in pollutant concentrations over several years. The trend analysis is based on monthly mean pollutant concentrations. Openair includes an option to "de-seasonalise" the data (i.e. statistically modify the plotted data to remove the influence of seasonal cycles, thus providing a clearer indication of the overall trend over the relevant time). The "de-seasonalise" option has been used in all the Theil-Sen trend graphs presented here. When the de-seasonalise option is used, Openair fills in any gaps in the data using a linear interpolation method.

In these plots the trend line is shown by a solid red line, with 95% confidence intervals for the trend shown by dotted red lines. The trend is given at the top of the plot in green, with confidence intervals shown in square brackets. The trend is given as units (i.e. µg m^{-3}) per year, over the period shown. This may be followed by a number of stars, with * indicating that the trend is statistically significant at the 0.05 level (low significance), ** indicating significance at the 0.01 level (significant) and *** indicating significance at the 0.001 level (highly significant). The symbol + indicates that the trend is significant at the 0.1 level.

[2] Carslaw DC and Ropkins K (2012). "Openair — An R package for air quality data analysis." Environmental Modelling & Software, 27–28(0), pp. 52–61. ISSN 1364-8152, doi: 10.1016/j.envsoft.2011.09.008.

2.3.1 Nitrogen Dioxide (NO_2)

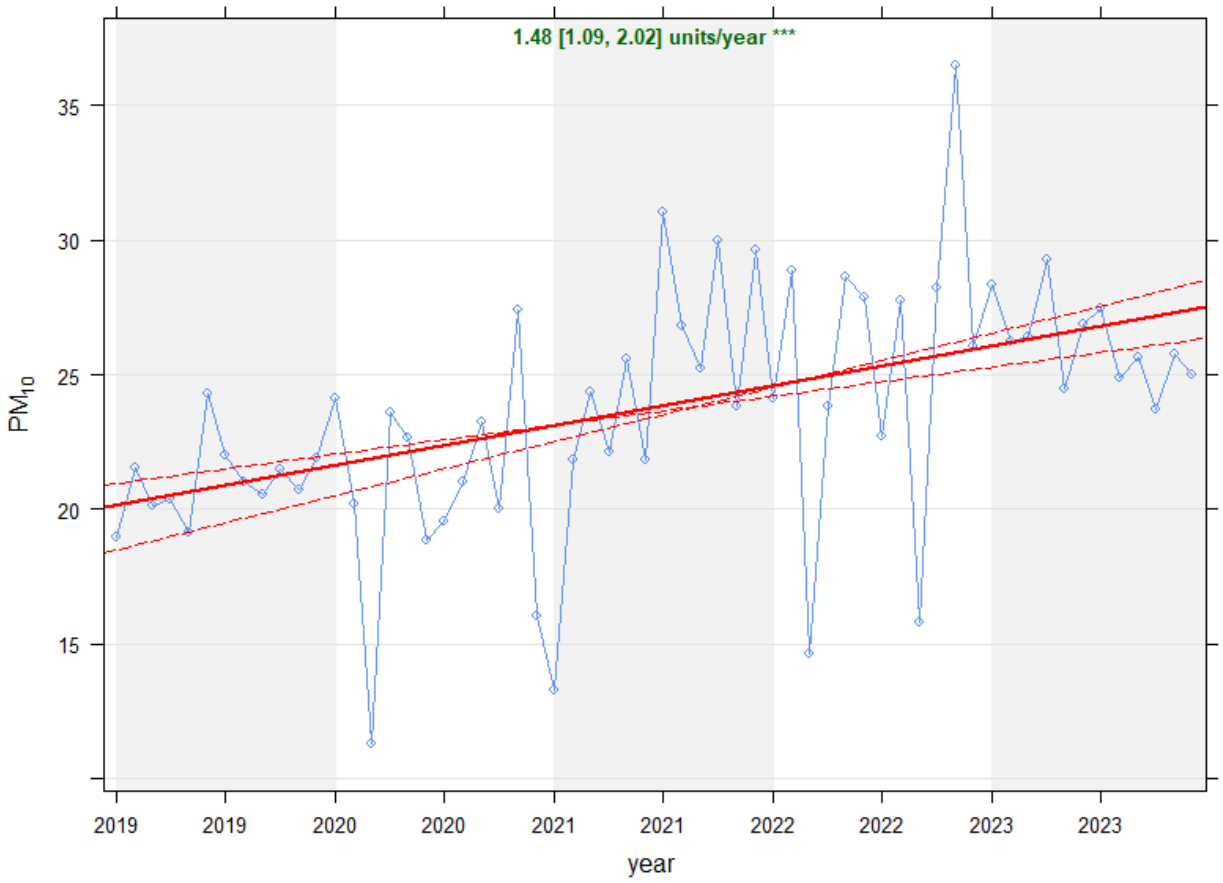
Figure 2.9 – Deseasonalised Trend in NO_2 Concentrations at Port Talbot Margam 2019 - 2023



From 2019 – 2023, there is a clear downward trend in NO_2 concentrations at Port Talbot Margam, at an average reduction of 0.9 µg/m³ per year. The relatively narrow range of the dotted 95% confidence intervals highlights a low variability in the downwards trend, indicating confidence in the trend. The three stars at the top of Nitrogen Dioxide (NO2) Figure 2.9 signifies that the trend is highly significant at the 0.001 level.

2.3.2 Particulate Matter (PM_{10})

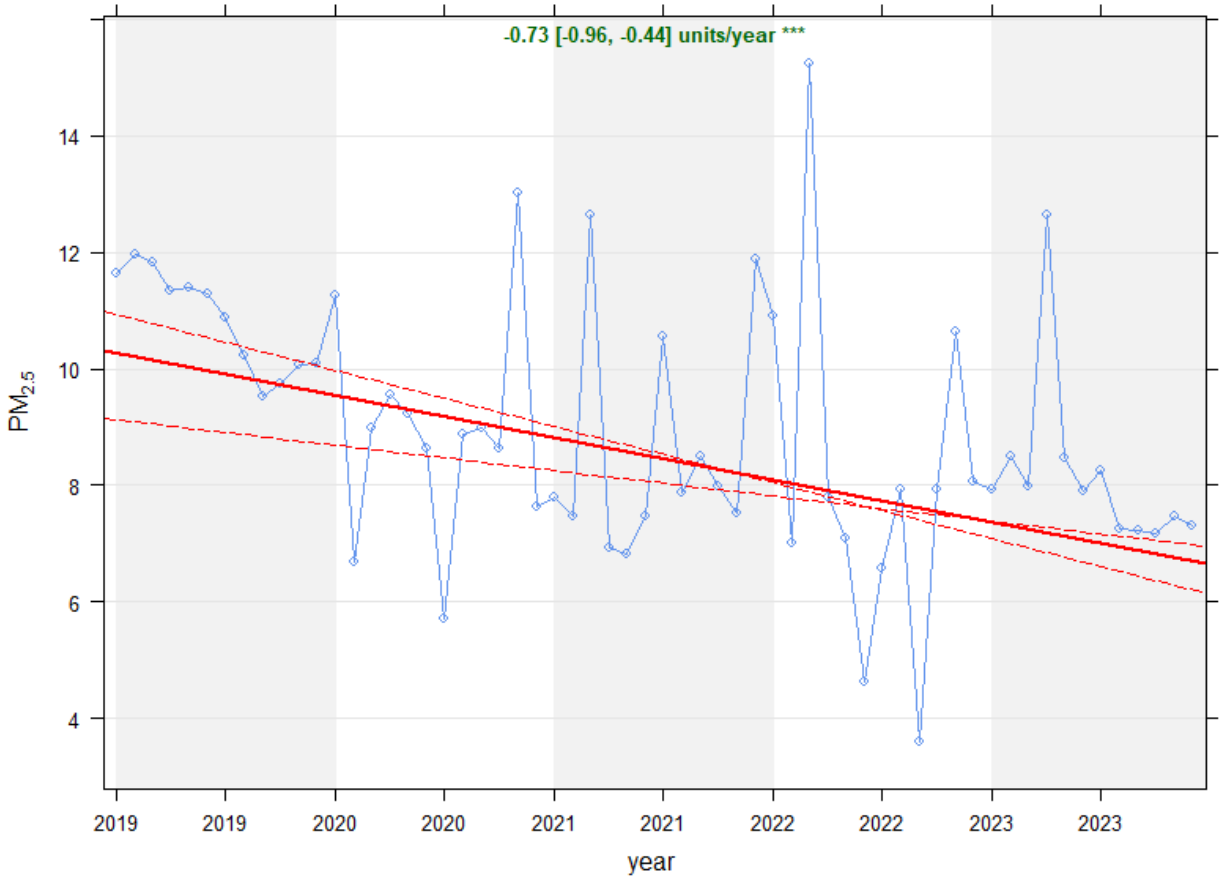
Figure 2.10 – Deseasonalised Trend in PM_{10} Concentrations at Port Talbot Margam 2019 - 2023



From 2019 – 2023, there is a clear upward trend in PM_{10} concentrations at Port Talbot Margam, at an average increase of 1.48 µg/m³ per year. Whilst there is considerable monthly variability, (blue line), the relatively narrow range of the dotted 95% confidence intervals highlights a low variability in the upward trend, indicating confidence in the trend. The three stars at the top of Figure 2.10 signifies that the trend is highly significant at the 0.001 level.

2.3.3 Particulate Matter ($PM_{2.5}$)

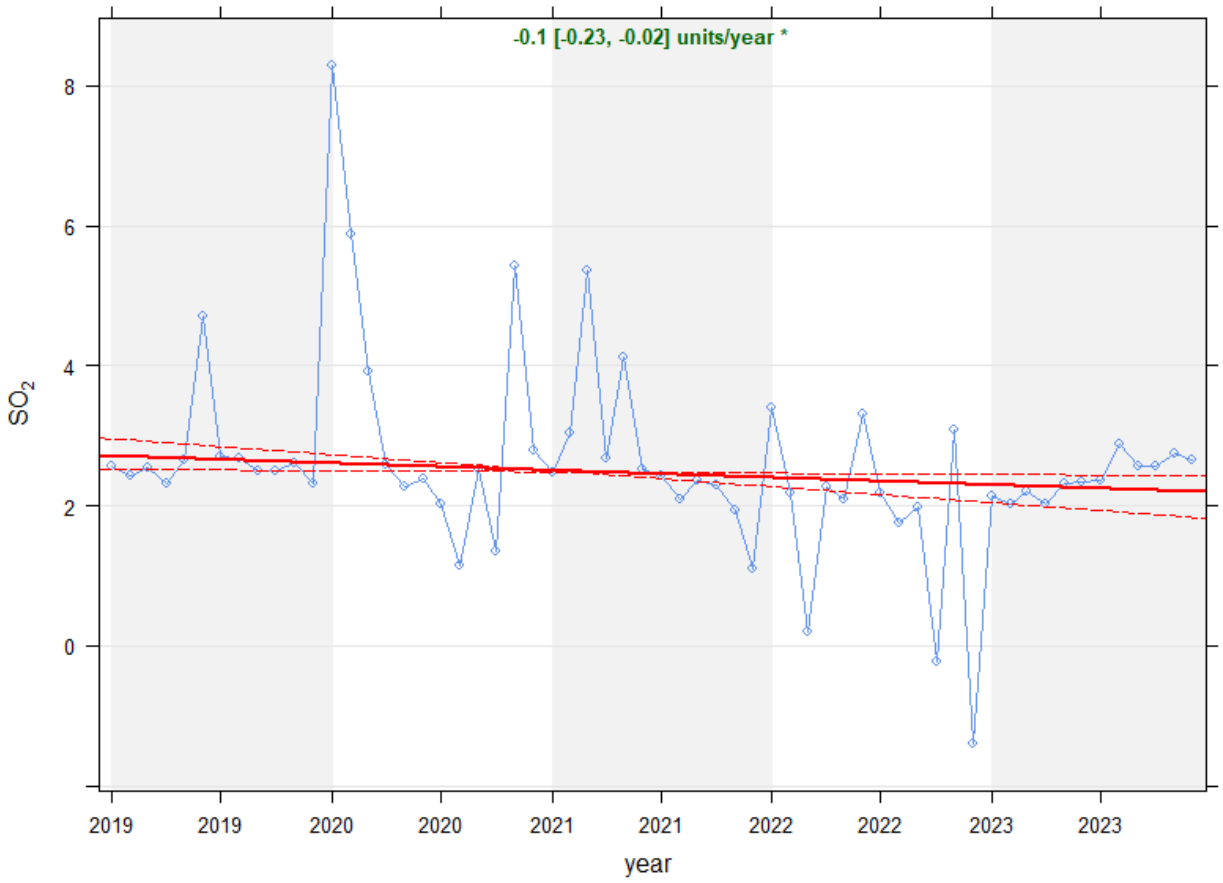
Figure 2.11 – Deseasonalised Trend in $PM_{2.5}$ Concentrations at Port Talbot Margam 2019 - 2023



From 2019 – 2023, there is a clear downward trend in $PM_{2.5}$ concentrations at Port Talbot Margam, at an average decrease of 0.73 µg/m³ per year. Whilst there is considerable monthly variability, (blue line), the relatively narrow range of the dotted 95% confidence intervals highlights a low variability in the downward trend, indicating confidence in the trend. The three stars at the top of Figure 2.11 signifies that the trend is highly significant at the 0.001 level.

2.3.4 Sulphur Dioxide (SO_2)

Figure 2.12 – Deseasonalised Trend in SO_2 Concentrations at Port Talbot Margam 2019 - 2023

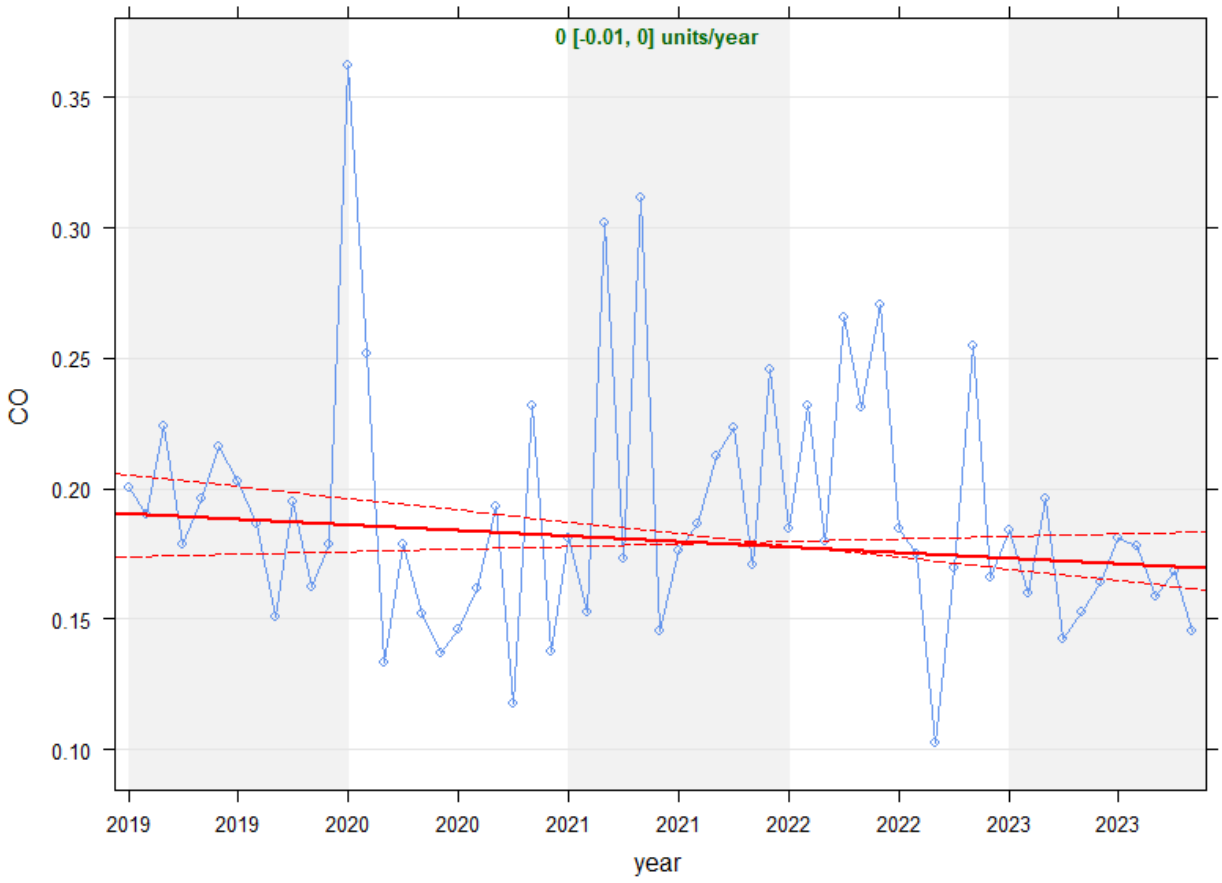


From 2019 – 2023, there is a small downward trend in SO_2 concentrations at Port Talbot Margam, at an average decrease of 0.1 µg/m³ per year. Whilst there is considerable monthly variability, (blue line), the relatively narrow range of the dotted 95% confidence intervals highlights a low variability in the downward trend, indicating confidence in the trend. The single star at the top of Figure 2.12 signifies that the trend is significant at the 0.05 level.

2.3.5 Carbon Monoxide (CO)

The deseasonalised trend in CO concentrations from 2019 to 2023 at the AURN continuous analyser in Port Talbot Margam (Fire Station) is shown in Figure 2-13. The plot indicates a slight downward trend in CO concentrations at the site.

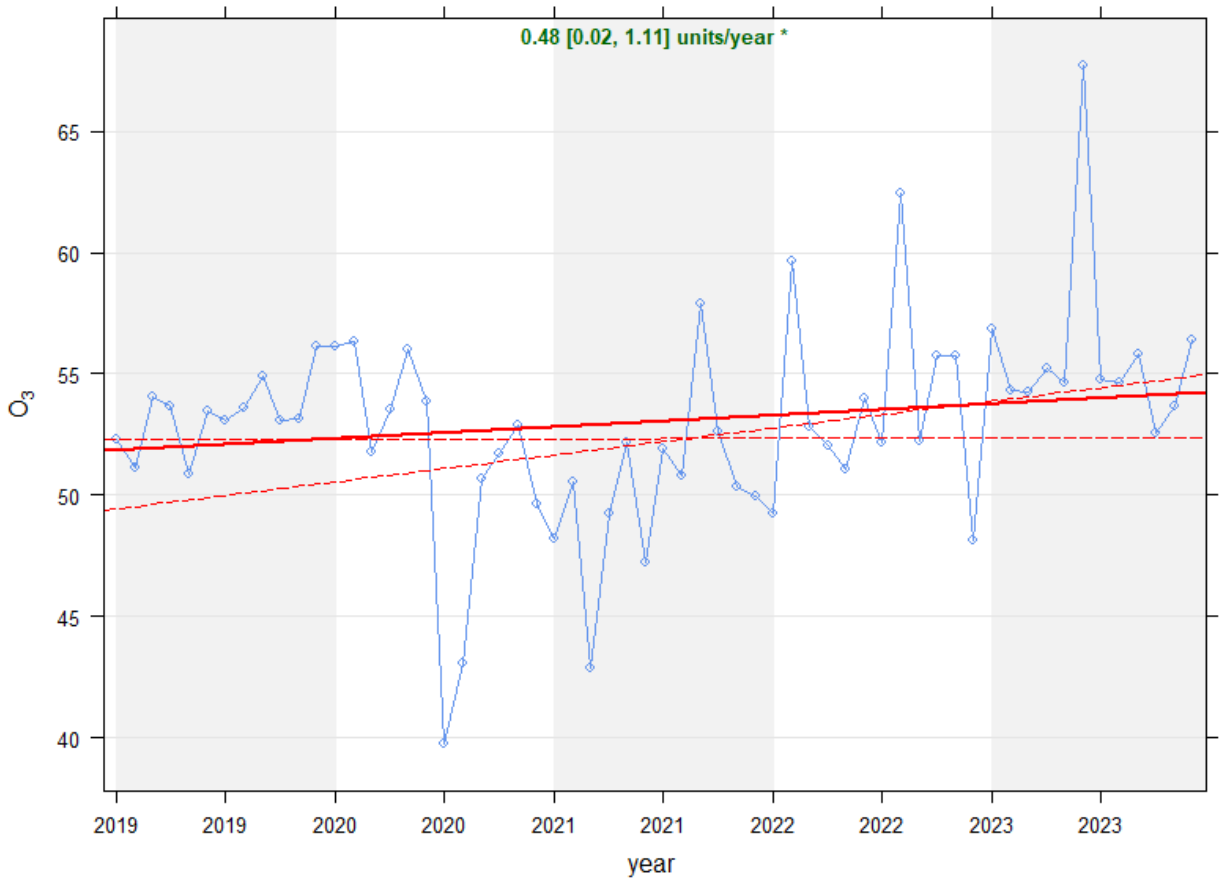
Figure 2-13 – Deseasonalised Trend in CO Concentrations at Port Talbot Margam 2008-2022



From 2019 – 2023, there is no significant trend in CO concentrations at Port Talbot Margam. Whilst there is considerable monthly variability, (blue line), the relatively narrow range of the dotted 95% confidence intervals highlights a low variability in the downward trend, indicating confidence in the trend.

2.3.6 Ozone (O_3)

Figure 2-14 - Deseasonalised Trend in O_3 Concentrations at Port Talbot Margam 2019-2023



From 2019 – 2023, there is a small increasing trend in O_3 concentrations at Port Talbot Margam, at an average increase of 0.48 µg/m³ per year. Whilst there is considerable monthly variability, (blue line), the relatively narrow range of the dotted 95% confidence intervals highlights a low variability in the downward trend, indicating confidence in the trend. The single star at the top of Figure 2-14 signifies that the trend is significant at the 0.05 level.

2.3.7 Polycyclic aromatic hydrocarbons (PAHs)

Polycyclic aromatic hydrocarbons (PAHs) are a group of persistent organic compounds, some of which are toxic and/or possible or proven human carcinogens; they are produced through industrial and incomplete combustion of carbon containing fuels.

Air quality standards have been set in UK and EU legislation and are based upon measurements of benzo[a]pyrene which is also known as B[a]P.

The UK Air Quality Objective for PAHs is based on the recommendations of the Expert Panel on Air Quality Standards (EPAQS). It specifies an annual air quality standard of 0.25 ng m^{-3} benzo[a]pyrene to be achieved by 2012.

The EU Air Quality Daughter Directive (2005/107/EC) specifies a target value of 1 ng m^{-3} for the annual mean concentration of benzo[a]pyrene to be achieved by 2012.

Monitoring of benzo[a]pyrene first commenced at Groeswen Hospital in 1999 using an Anderson sampler. This equipment was replaced by a Digitel sampler in the last quarter of 2007. Monitoring has taken place at Port Talbot Margam (Fire Station) since 2007, after being relocated from Groeswen Hospital.

The UK standard of 0.25 ng m^{-3} benzo[a]pyrene was exceeded in at both benzo[a]pyrene sites in 2023. Results from the past 25 years at Port Talbot Margam are displayed in Figure 2-15.

In addition to monitored air quality data, modelling techniques are used to predict pollution levels in the wider area beyond the monitoring sites. NPT have recently been made aware by Welsh Government that modelling exercises undertaken by Environment Agency suggests that the target value at Port Talbot is at risk of being exceeded in future years.

A report by Ricardo in 2022 identified sites on the monitoring network where there were compliance problems with the UK Air Quality Objective (https://uk-air.defra.gov.uk/assets/documents/reports/cat09/2203150935_2020_PCM_technical_report.pdf). Compliance issues were identified at Port Talbot due to the steel works (likely associated with coke production). Exceedances of the objectives were modelled in 7 km^2 of the South Wales zone and 3 km^2 of the Swansea Urban Area. These were associated with industrial emissions from the coke oven at the steel plant at Port Talbot.

In response to this report in December 2022, a new analyser was installed at Margam Youth Centre. The analyser was installed as the aforementioned modelling suggested that Port Talbot Margam was not best positioned to provide measurements that are

representative of the typical emission footprint originating from the steelworks. For 2023, Margam Youth Centre reported a annual mean B[a]P concentration of 1.2 ng m^{-3}, exceeding both the Air Quality Objective of 0.25 ng m^{-3} and EU target value of 1 ng m^{-3}.

Figure 2-15 - Benzo[a]pyrene Annual Averages 1999-2023

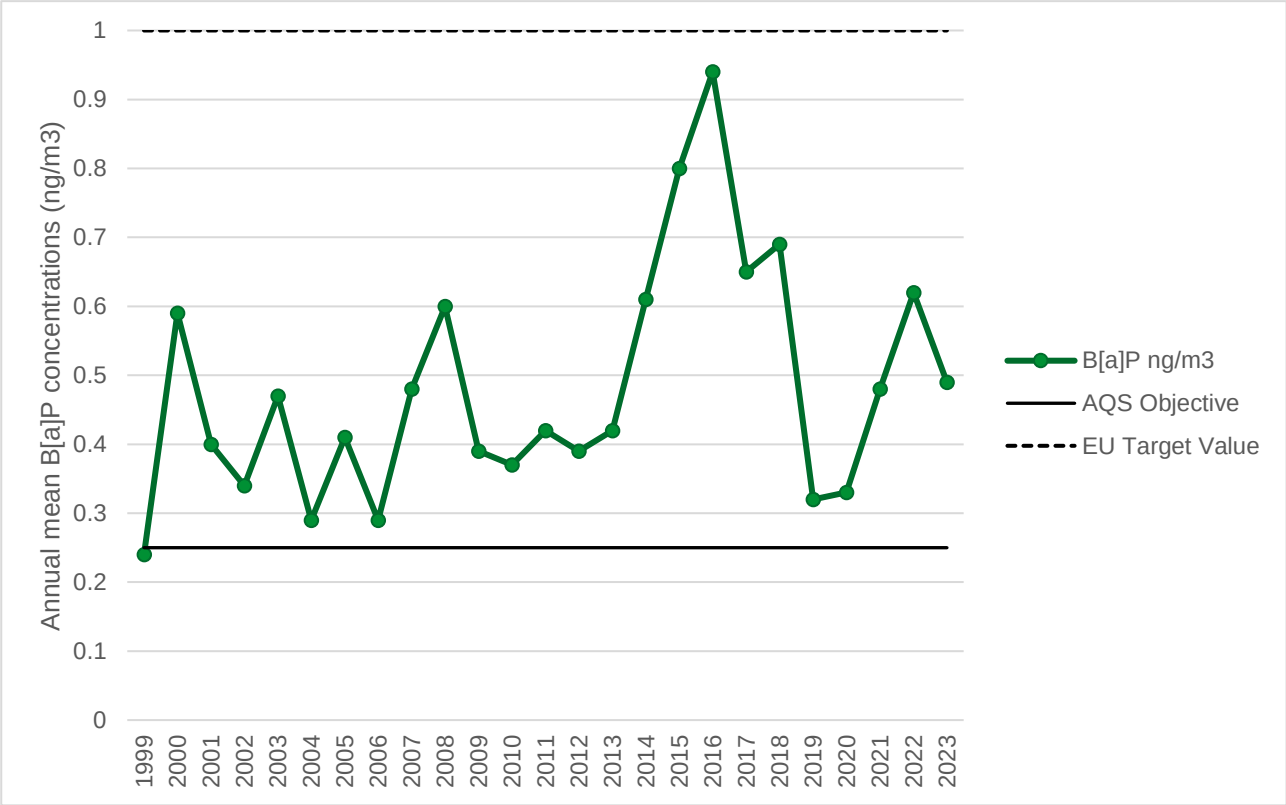


Figure 2-16 shows the modelled annual mean B(a)P concentration at a 100 m x 100 m spatial resolution in the vicinity of the coke ovens at Port Talbot. The complex terrain surrounding Port Talbot is shown in Figure 2-17. This influences the dispersion of emissions from the coke ovens in this location and is included in the modelling.

Figure 2-16 - Modelled Total Annual Mean B[a]P Concentrations in the Vicinity of the Coke Ovens at the Port Talbot Steelworks in 2020

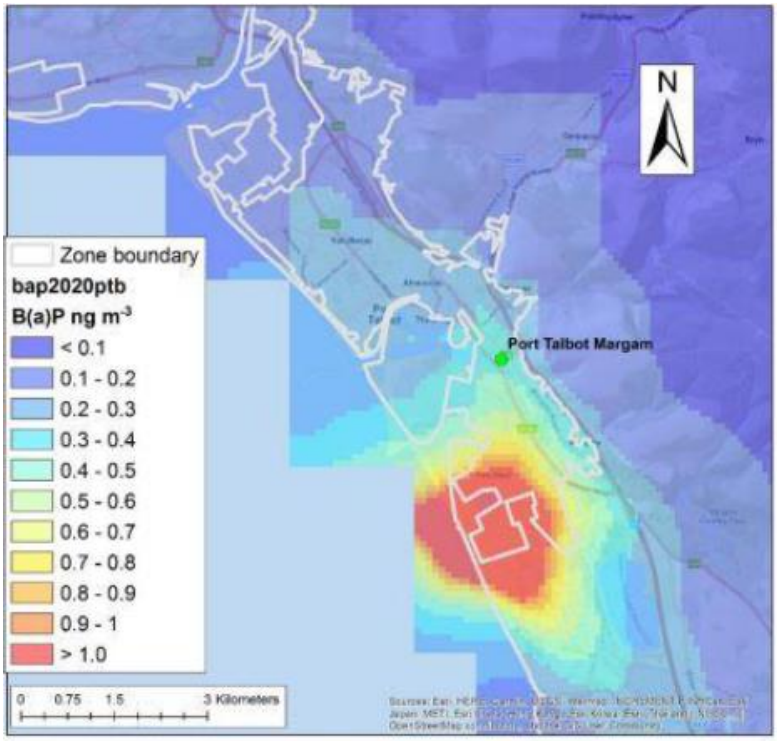


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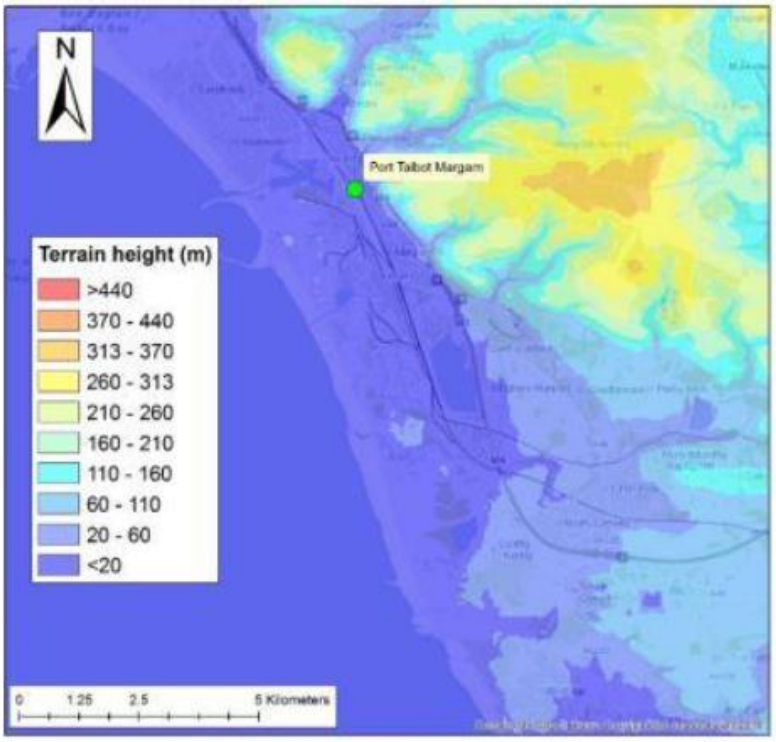
Figure 2-17 - Terrain Heights in the Vicinity of Port Talbot



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2.3.8 Metals

Monitoring of 13 airborne metals has been carried out in the Pontardawe area since 1972. The objectives are to establish whether local industry has any significant impact upon airborne metal concentrations in the area.

Monitoring is currently in operation at the following sites:

- Port Talbot Margam Fire Station (AURN site in Port Talbot)
    - Metals have been measured at this site since February 2008 as part of the UK Heavy Metals Network.
- Pontardawe Brecon Road
    - Monitoring commenced here in August 2011. The site is approximately 500 m northeast of the Wall Colmonoy works. This site is within the residential location nearest the area predicted to have the highest modelled nickel downwind concentrations although the monitor is elevated above the works. Wall Colmonoy is a manufacturer of metal alloys and is subject to an Environmental Permit issued by NPT. Approximately 500 tonnes of nickel are used at this permitted site each year to manufacture a variety of products.
- Pontardawe Leisure Centre
    - This site is approximately 4 km downwind of the Nickel works at Clydach and approximately 1 km upwind of the Wall Colmonoy works.
- Pontardawe Tawe Terrace
    - Monitoring has been ongoing at this site, approximately 270 m from Wall Colmonoy's Part B permitted site in Pontardawe since September 2009.
- Neath Milland Road
    - Measurements at this site commenced in December 2014. It lies between the Sandvik Osprey plant and the nearest receptors in King Street.

Monitoring is carried out in respect of the following metals:

- Arsenic (As)
- Cadmium (Cd)
- Cobalt (Co)
- Chromium (Cr)
- Copper (Cu)
- Iron (Fe)
- Mercury (Hg)

- Manganese (Mn)
- Nickel (Ni)
- Lead (Pb)
- Selenium (Se)
- Vanadium (V)
- Zinc (Zn)

2.3.8.1 Target values

In 2004 the European Union published the "4th Daughter Directive" which set annual mean target levels of arsenic, cadmium and nickel (2004/107/EC), to be achieved by 31st December 2012:

- Arsenic: 6 ng m^{-3}
- Cadmium: 5 ng m^{-3}
- Nickel: 20 ng m^{-3}

Monitoring using a method compliant with the Directive (Partisol 2025 sampler) commenced during 2006. During 2021 and 2022, all the ambient air samplers across the network were replaced with Digitel DPA-14 samplers.

- The annual mean concentrations of monitored metals for 2023 are summarised in Table 2-11.

Table 2-11 - Annual Mean Concentrations of Heavy Metals at Five Monitoring Sites in 2023 (ng m^{-3})

Heavy Metal	Port Talbot Fire Station	Pontardawe Brecon Road	Pontardawe Leisure Centre	Pontardawe Tawe Terrace	Neath Milland Road
As	0.78	0.54	0.57	0.60	1.29
Cd	0.51	0.17	0.20	0.30	0.26
Co	0.25	0.17	0.34	0.93	0.82
Cr	4.10	1.06	2.13	4.04	13.29
Cu	14.52	3.02	2.42	4.31	32.51
Fe	2.86*	181.11	149.80	204.69	482.33
Hg*	-	-	-	-	-
Mn	40.38	3.61	3.91	6.34	9.26
Ni	1.08	2.16	4.81	12.29	7.46
Pb	8.56	4.49	4.79	4.56	16.62
Se	1.09	0.55	0.56	0.56	0.57
Zn	4.04	0.49	0.53	0.57	0.83
V	38.71	10.49	11.88	10.37	36.46

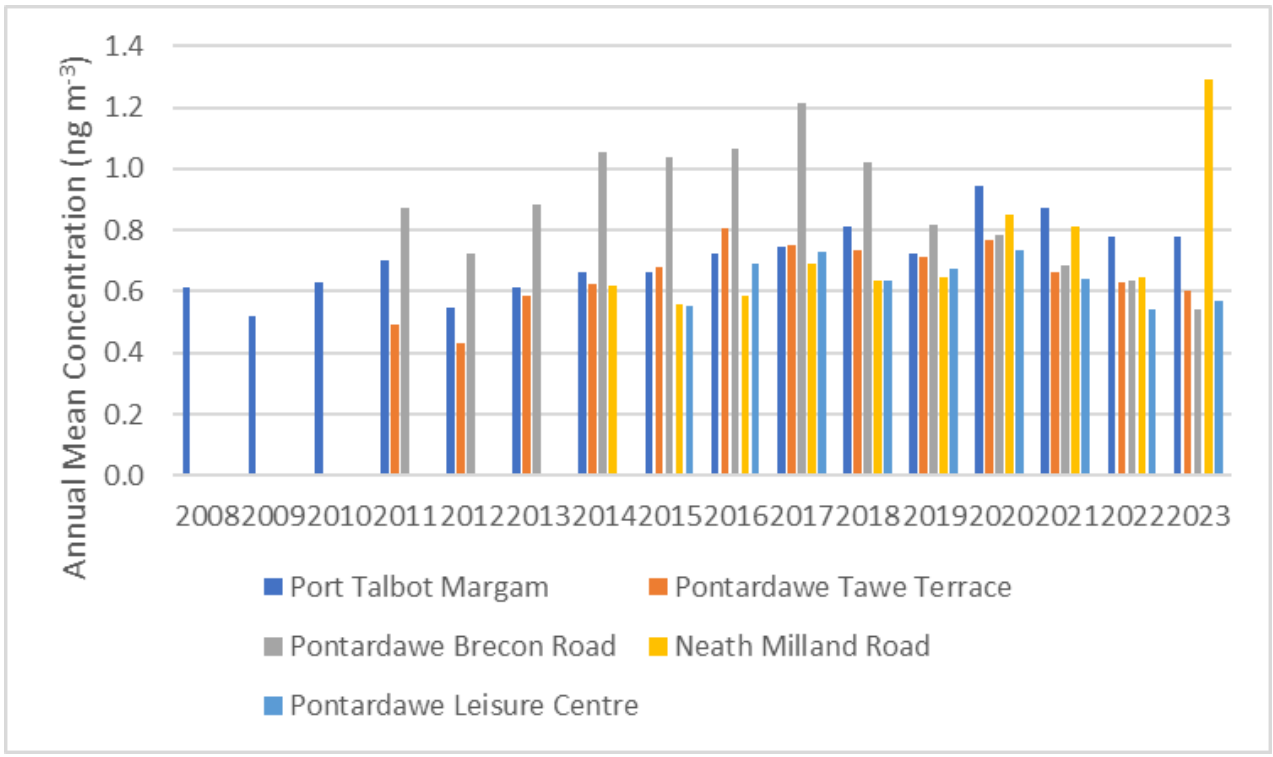
* The UKAIR data selector provided a mean Iron (Fe) concentration of 2.86 ug/m^3, however this is unlikely to be correct and has been omitted for this APR. Between 2008 – 2022, the typical range for the annual mean concentration of Iron at Port Talbot Fire station is 2000 – 3500 ug/m^3, further highlighting that the measurement is unlikely to be correct.

2.3.8.2 Arsenic

The annual average concentration of arsenic for 2023 was between 0.5 and 1.3 ng m^{-3}, well below the EU target level. The maximum weekly concentration observed was 4.25 ng m^{-3}, which is 70% of the Target Value but above the Higher Assessment Threshold value of 3.6 ng m^{-3}.

Historic data for five long-term monitoring sites over the period 2008 to 2022 is presented in Figure 2-18. The highest annual mean concentrations were measured at the Pontardawe Brecon Road site until around 2019. Since 2020, higher annual mean concentrations have been measured at the Port Talbot Margam site, though in 2023 Neath Milland Road recorded it's highest annual mean concentration of arsenic at 1.29 ng m^{-3}. Neath Port Talbot County Borough Council are investigating the cause of the spike in Arsenic at Milland Road.

Figure 2-18 - Trend in Annual Mean Concentrations of Arsenic 2008 - 2023

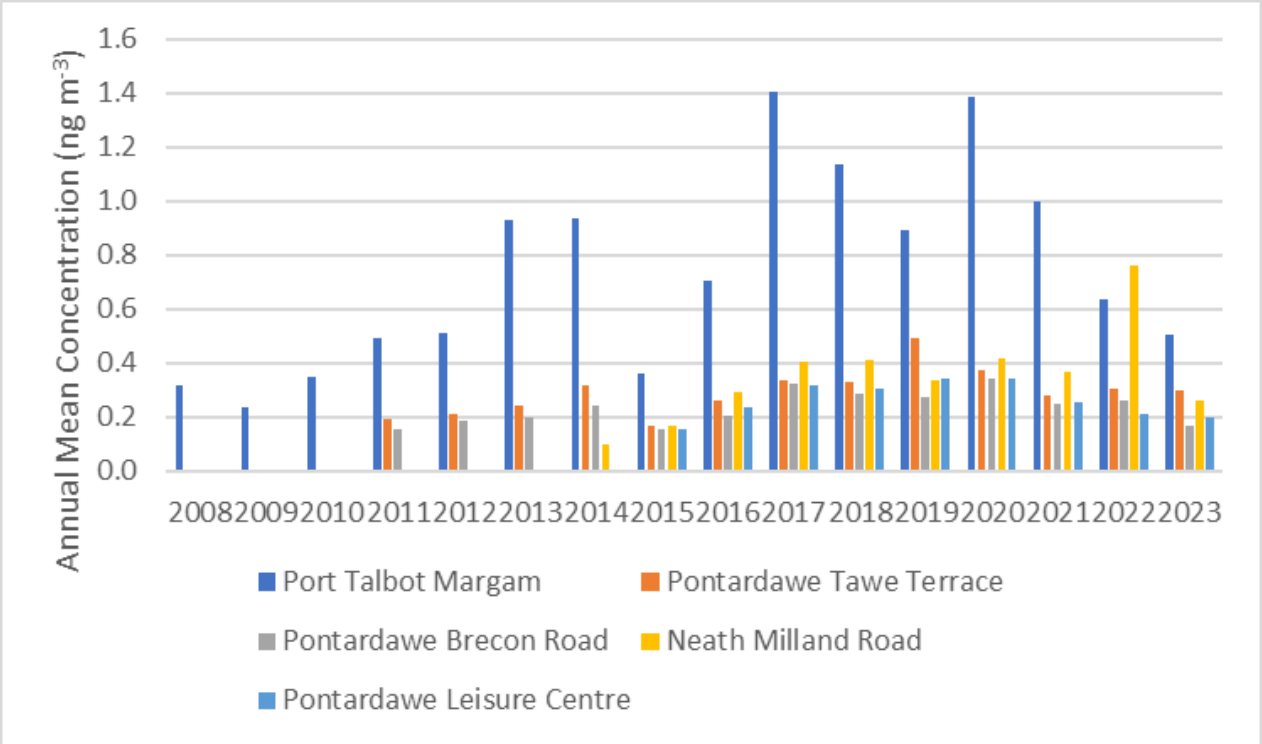


2.3.8.3 Cadmium

The annual average concentration at Port Talbot Margam was 0.51 ng m^{-3}. This is below the EU Directive's target of 2 ng m^{-3} and represents 10% of the Target Value (5.2 ng m^{-3}). The maximum weekly concentration observed was 4.27 ng m^{-3} at Pontardawe Tawe Terrace (82 % of the Target Value).

Figure 2-19 presents historic data for five long-term monitoring sites over the period 2008 to 2023. Annual mean concentrations of cadmium have showed a decreasing trend since 2020. Concentrations have remained roughly the same at the other sites over the last five years except for Neath Milland Road, which doubled between 2021 and 2022, but decreased again in 2023.

Figure 2-19 - Trend in Annual Mean Concentrations of Cadmium 2008 - 2023



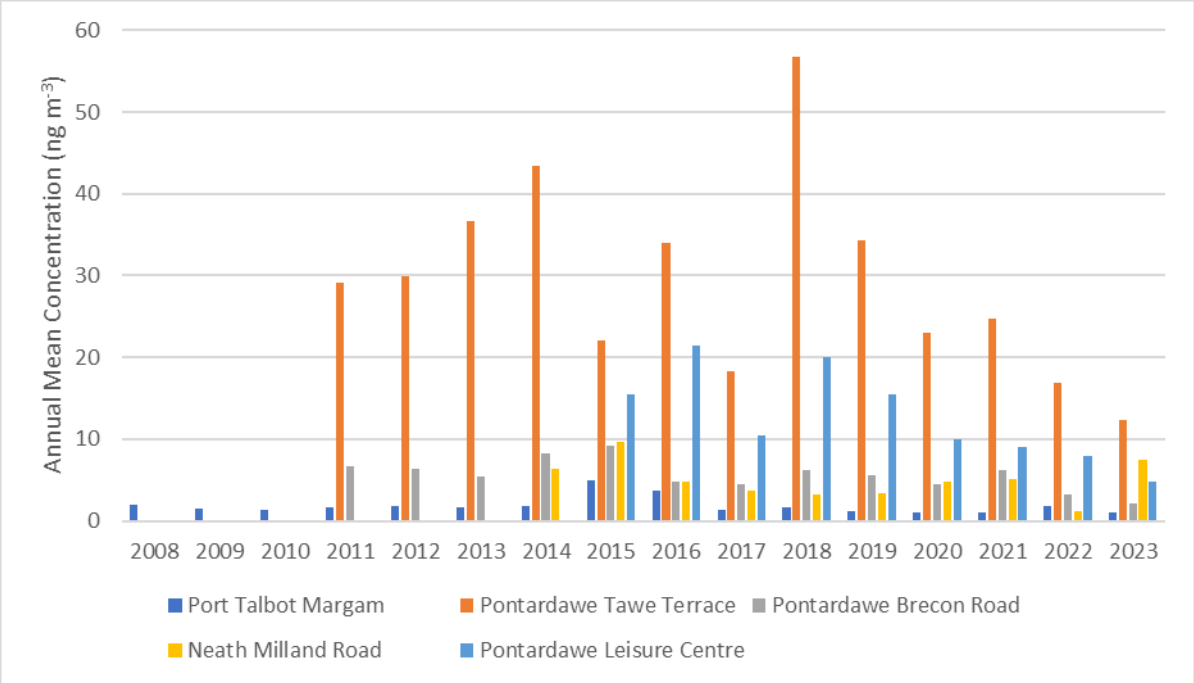
2.3.8.4 Nickel

The annual average concentration at the five long-term monitoring sites ranged from 1 to 12.3 ng m^{-3}. At 12.3 ng m^{-3}, Pontardarwe Tawe Terrace exceeded the EU Directive's Lower Assessment Threshold value of 10 ng m^{-3}. The maximum weekly concentration observed was 71 ng m^{-3} at Neath Milland Road (355 % of the Target Value). This was found to be as a result of a leak from a seal on abatement plant at Sandvik Osprey which has been rectified.

The Council as regulator of Wall Colmonoy, continues to place the emphasis on maintenance checks to bring ambient nickel levels in compliance with the Target.

Figure 2-20 presents historic data for five long-term monitoring sites over the period 2008 to 2023. The highest concentrations are measured at the Pontardawe Tawe Terrace site, as expected. Annual mean concentrations of nickel at this site have decreased since 2018. The next highest concentrations have been measured at the Port Talbot Margam site and these have also decreased since 2018, whilst concentrations increased at Neath Milland Road.

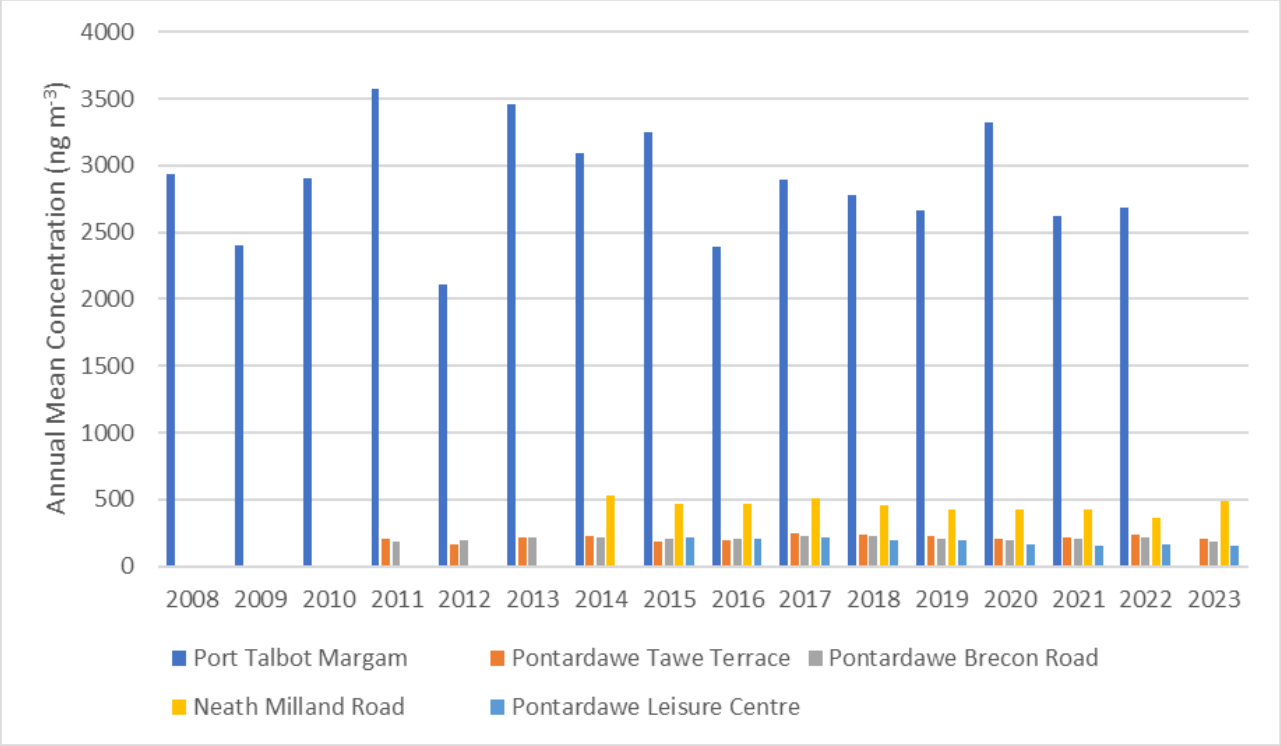
Figure 2-20 - Trend in Annual Mean Concentrations of Nickel 2008 - 2023



2.3.8.5 Iron

Figure 2-21 presents historic data for five long-term monitoring sites over the period 2008 to 2023. Annual mean concentrations of iron dropped in 2021 and have remained roughly the same in 2023, albeit a 35% increase at Neath Milland Road from 2023 compared to 2022. There are no target values set for levels of iron. The highest concentrations are consistently measured at the Port Talbot Margam site, however for 2023 the measured Iron concentration at Margam was 2.86 ng m^{-3}. This is likely due to an instrument error. Neath Port Talbot County Borough Council are investigating the cause of the reported low Iron concentration at Margam.

Figure 2-21 - Trend in Annual Mean Concentrations of Iron 2008 - 2023



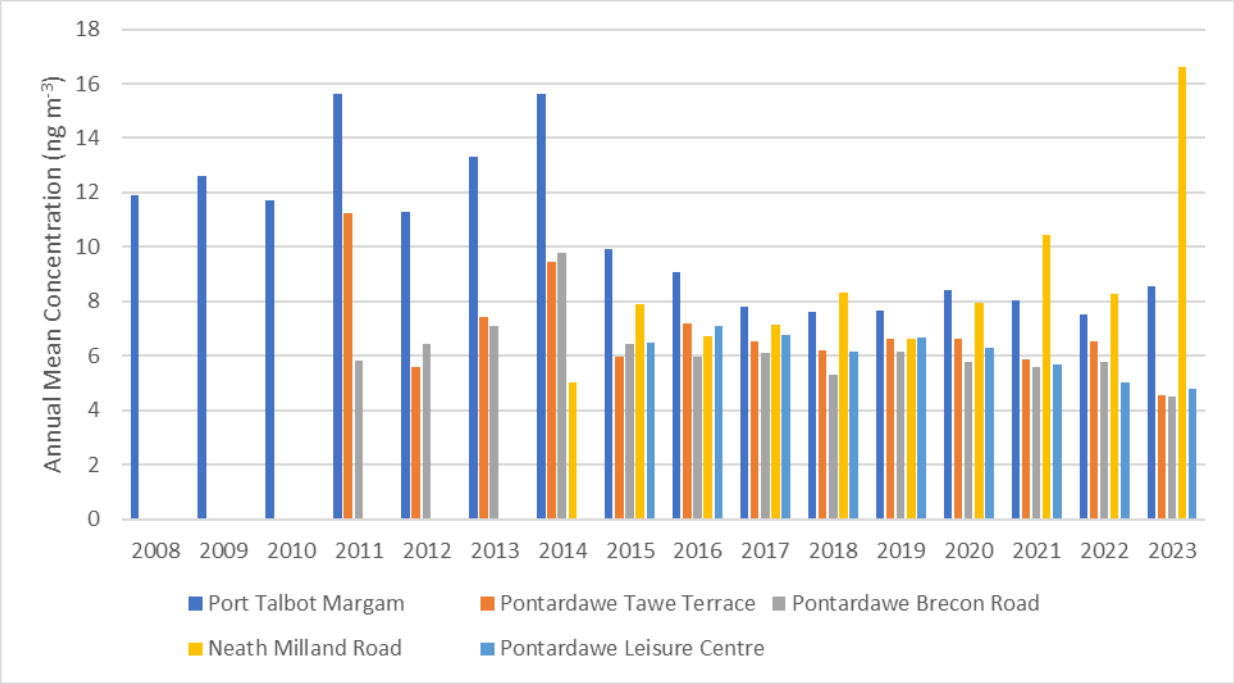
2.3.8.6 Lead

In 2023 the annual average concentration of lead was between 4.5 ng m^{-3} and 16.6 ng m^{-3}, well within the Air Quality Objective of 0.25 µg m^{-3} (250 ng m^{-3}) (to be achieved by 31st December 2008). The analysis and reporting are contracted to the National Physical Laboratory.

Historic lead data for five long-term monitoring sites over the period 2008 to 2023 is presented in Figure 2-22. It shows that average concentrations have decreased below 10 ng m^{-3} since 2015. Over the past six years, concentrations have remained roughly the same at approximately 8 ng m^{-3}. In 2023, the concentration of lead increased to 16.6 ng m^{-}

^{3} at Neath Milland Road. The highest annual mean concentrations are consistently measured at the Neath Milland Road and Port Talbot Margam site.

Figure 2-22 - Trend in Annual Mean Concentrations of Lead 2008 - 2023



2.3.9 Grit and Dust

Deposit gauges have been used to collect atmospheric fallout from several locations. During 2023, sampling of this kind took place at six sites in the County Borough (locations shown in Prince Street, Margam, Port Talbot – measuring dust from Steelworks

- Little Warren, Port Talbot – measuring dust from Steelworks (this was relocated December 2021 due to continued vandalism)
- Dyffryn Upper School, Bertha Road, Port Talbot – measuring dust from Steelworks
- Port Talbot Fire Station – measuring dust from Steelworks
- Wembley Avenue, Onllwyn – measuring opencast mine
- Tairwaith Community Hall – measuring opencast mine

Figure 2-23 details the annual average and maximum deposition, alongside a comparison with the “nuisance limit” (200 mg m^{-2} day^{-1}), which is recognised by the IAQM Guidance as relevant for this method of monitoring. However, it should be noted that this “limit” is not statutory and is relevant to construction guidance. Public perception of what constitutes a nuisance might suggest that a lower “limit” would be appropriate. The Minerals Technical Advice note from Welsh Government suggests a limit of 80 mg m^{-2} day^{-1} for coal working, this has also been presented for comparison purposes (Table 2-12).

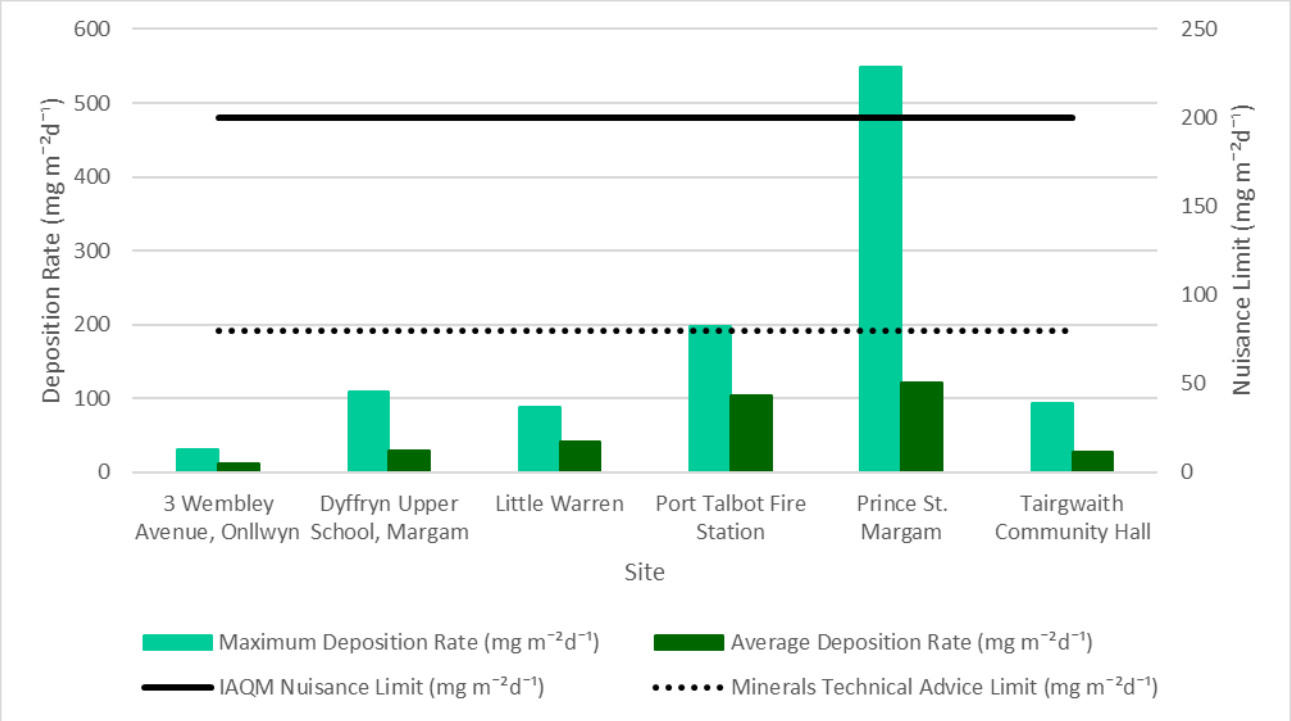
Table 2-12 – Nuisance Dust Fallout Categories used by NPT

Fallout rate mg/m²/day	Category
< 40	Low
40 to 79	Moderate
80 to 159	High
> 159	Very high

During 2023 the higher IAQM nuisance limit was exceeded for the maximum deposition rate at one site (Prince St Margam). The average deposition rates for all sites were below this suggested nuisance limit.

The Minerals Technical Advice Limit was exceeded at one out of six sites (Prince St Margam) for the maximum deposition rate. It is worth noting that this limit is associated with coal works, and there is no statutory limit for dust.

Figure 2-23 - Summary of Dust Deposition Results Compared with Recommended Limit Values



The maximum dust deposition rate data for the past four years is shown in Figure 2-24. The highest maximum rates are consistently measured at the Port Talbot Fire Station site, though for 2023 this was at Prince St Margam. As in previous years, the Port Talbot sites at the Fire Station and Prince Street remain the highest in terms of average deposition rate (Figure 2-25).

Figure 2-24 - Maximum Dust Deposition Rate Results for 2020 to 2023 Compared with Recommended Limit Values

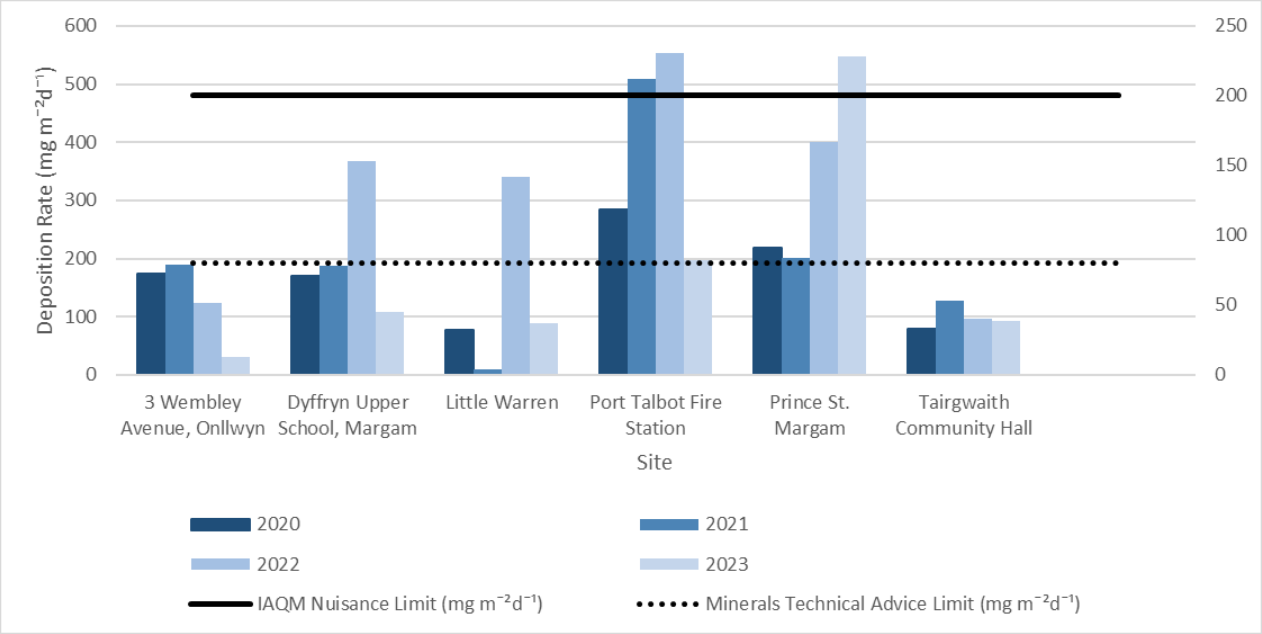
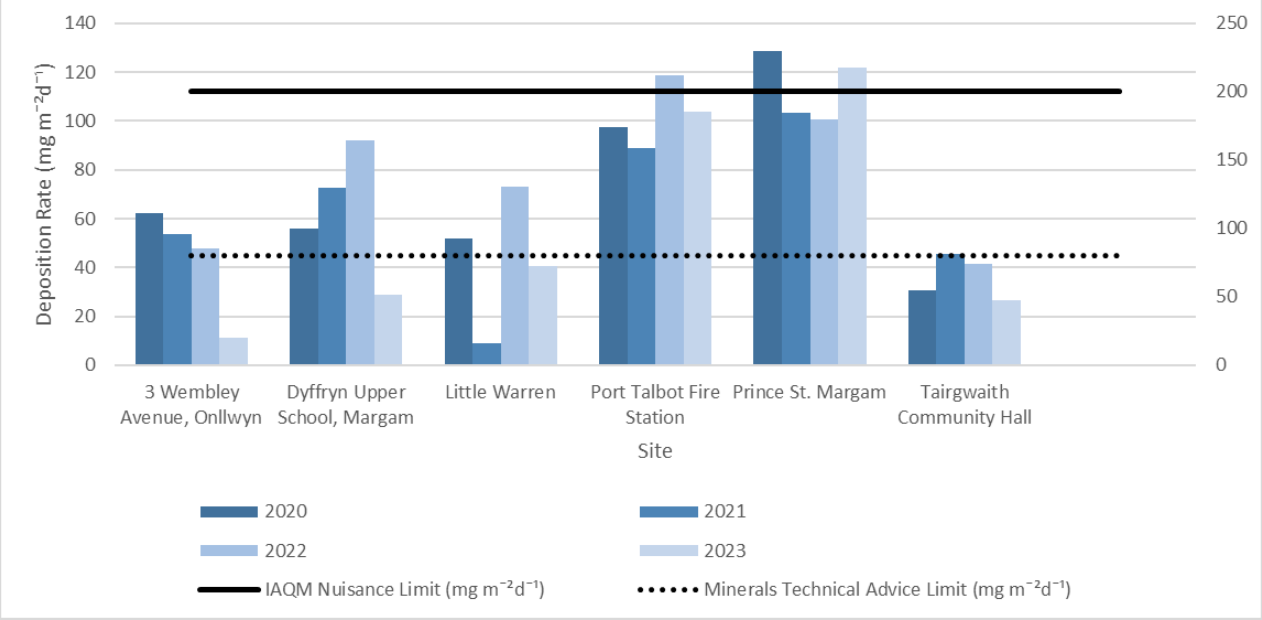


Figure 2-25 - Average Dust Deposition Rate Results for 2020 to 2023 Compared with Recommended Limit Values



A summary of the average components of the grit and dust monitored in 2023, as tested using Scanning Electron Microscopy (SEM) / Energy Dispersive X-ray Spectroscopy (EDS), are presented in Figure 2-26. Results for carbonised coal and fly ash sphere are no longer included as these have been consistently reported as zero.

Unburnt coal / carbonaceous matter constitutes the largest proportion of the dust deposited at all sites, averaging between 38 and 55%. The percentage of ‘general dirt’ is

also high (24 to 29%) at all sites. The remainder is made up by silicon-rich, calcium-rich and iron-rich particles. The highest percentage of silicon-rich and calcium-rich particles are found at Port Talbot Fire Station. Port Talbot Fire Station has the highest percentage of iron-rich particles (22%).

Figure 2-26 - Components of Monitored Grit and Dust 2023

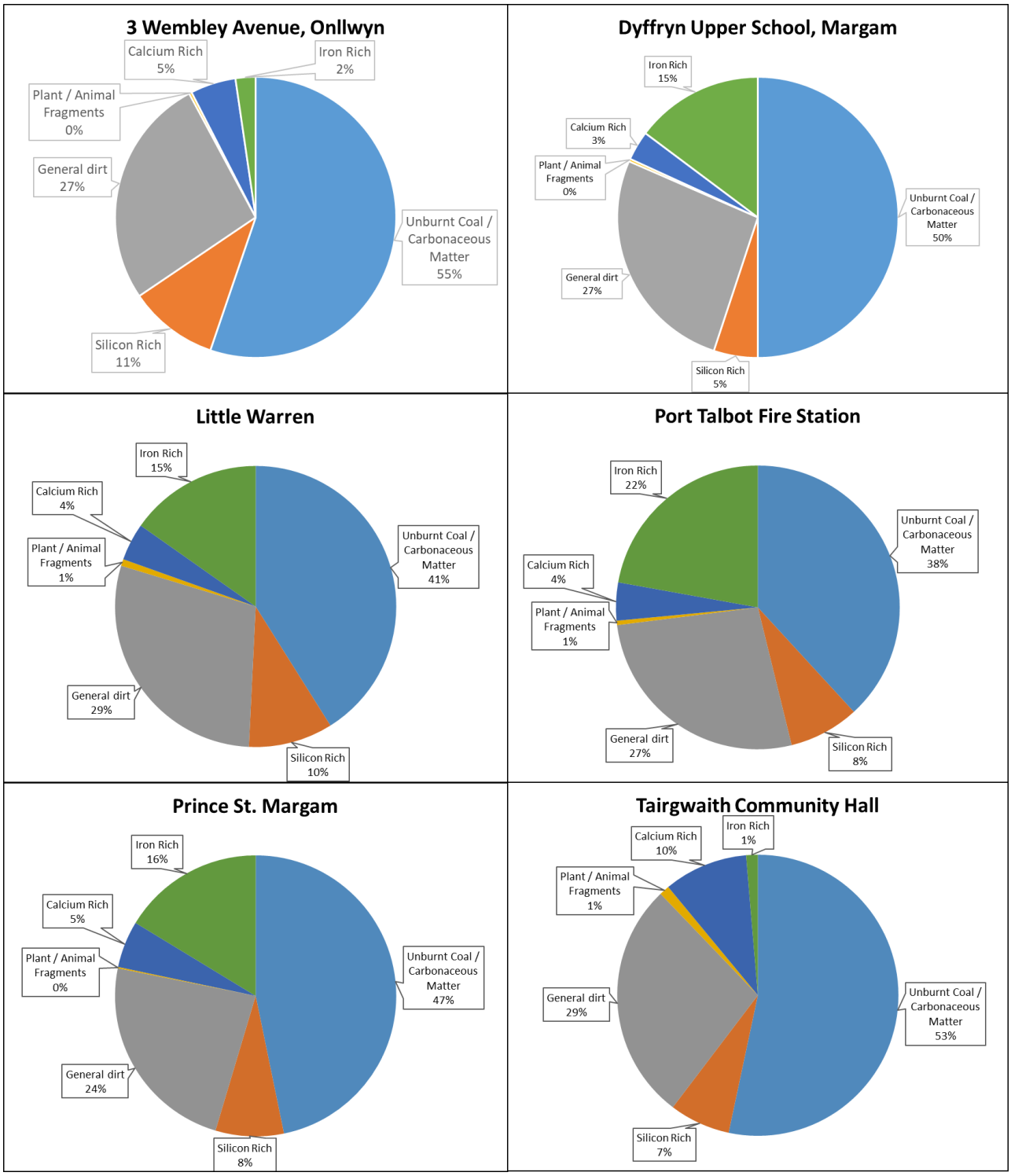
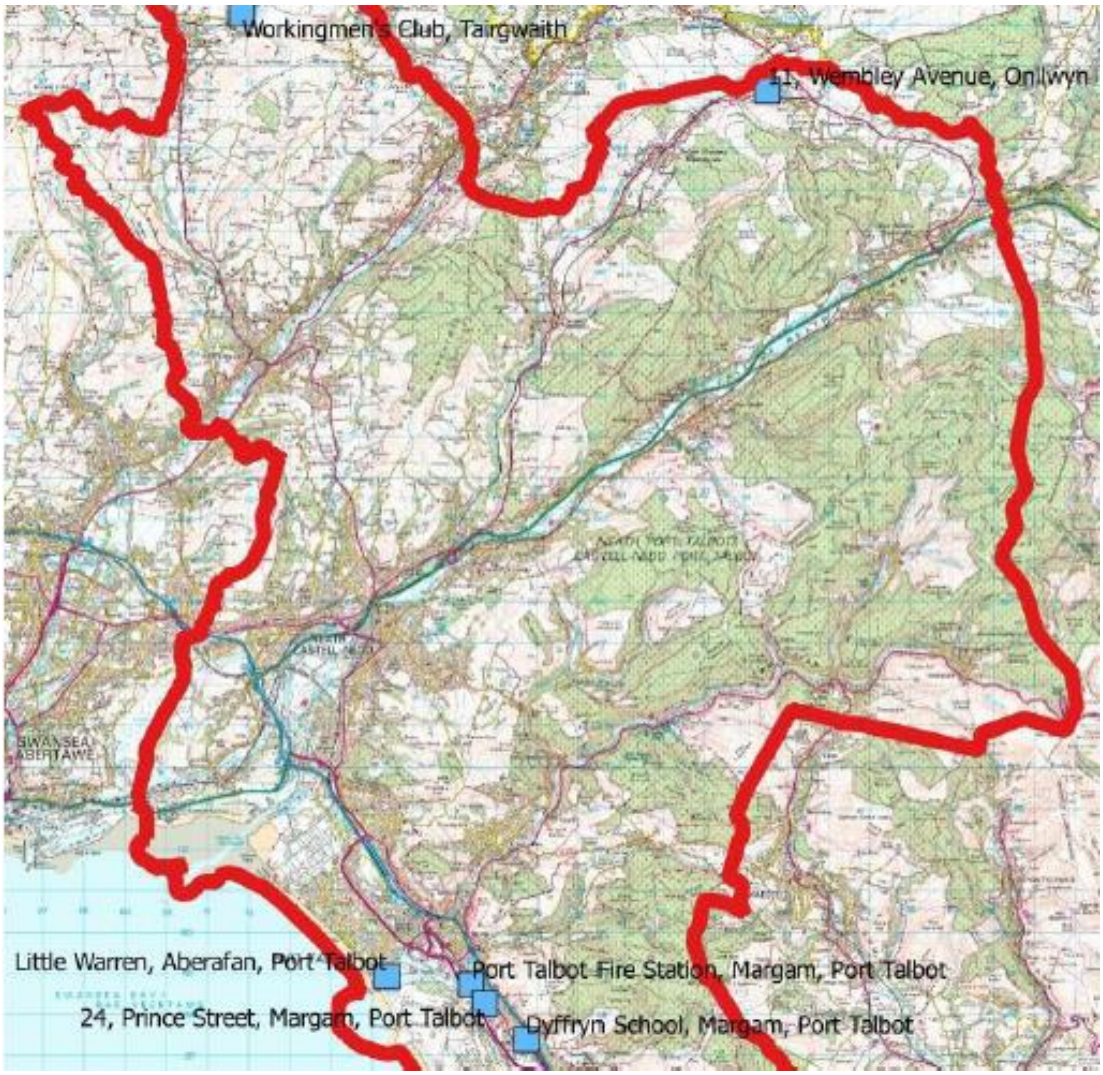


Figure 2-27 – Location of Deposit Gauges



2.4 Summary of Compliance with AQS Objectives as of 2023

NPT has examined the results from monitoring in the borough. Concentrations are all below the objectives, with the exception of Prince Street 2, where the number of 24-hour mean PM_{10} periods above 50 µg m^{-3} exceeded the limit of 35 days (45 days).

Annual mean measured concentrations of PM_{10} within the Taibach Margam AQMA have remained roughly the same over the last five years and are well below the AQS objective. Exceedances of the 24-hour PM_{10} objective are still occurring regularly at the three measurement sites within the Taibach Margam AQMA.

The identification of a new exceedance at the Prince Street monitor would ordinarily have triggered a Detailed Assessment to establish the boundary of an AQMA. However, Prince Street is located within the current AQMA in the Taibach Margam area which was declared

in July 2000. The Council has given consideration to whether or not the boundary should be amended, however, for the following reasons it is not considered necessary;

- The exceedance falls within the existing AQMA
- The source of the exceedance remains the same, i.e., the Steelworks
- Nearby monitors closer to the AQMA boundary are not exceeding the AQO
- The boundary encompasses all sensitive receptors in the area
- Any mitigation for the exceedance will be provided by this AQAP

It is unlikely that the AQMA would be considered for revocation in the near future unless it meets the daily mean PM_{10} AQO for at least three years.

3 New Local Developments

3.1 Road Traffic Sources (and Other Transport)

There have been no changes to road traffic sources during 2023 that meet the associated criteria for further consideration.

3.2 Industrial / Fugitive or Uncontrolled Sources / Commercial Sources

There have been no new industrial sources during 2023 that meet the associated criteria for further consideration.

There have been no new fugitive or uncontrolled particulate matter sources during 2023 that meet the associated criteria for further consideration.

There have been no new commercial sources during 2023 that meet the associated criteria for further consideration.

3.3 Other Sources

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

NPT 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.

3.4 Planning Applications

A total of 79 applications were reviewed by Environmental Health for impacts on air quality. Policy SP16(1) of Neath Port Talbot's Local Development Plan seeks to protect the environment by ensuring that development does not have any significant adverse impact on air quality. Policy EN8 seeks to prevent proposals which would be likely to have an unacceptable adverse effect on health, biodiversity and/or local amenity or would expose people to unacceptable risk due to air pollution.

A planning application was approved at the start of 2023 for Land West of Junction 38 of the M4 (Reference - P2021/1255) after more information was requested due to potential impacts on the M4 Junction. It is a full planning application of the development of a metal processing facility totalling 28,500 m^2 of floorspace comprising a powder processing plant (17,377 m^2), warehouse and store (5,428 m^2) office building (1,442 m^2), amenity building (776 m^2), laboratory (200 m^2), services building (470 m^2), substation (107 m^2), phase 2 (2,700 m^2), CCTV, storage tanks and plant, parking, servicing and roads and associated works. Further information can be found on the planning portal.

A planning application was approved in November 2023 for a sustainable aviation fuel production facility at Crown Wharf, Port Talbot Docks, Port Talbot, SA13 1RA (Reference - P2023/0858). The proposal was supported by an air quality impact assessment that was reviewed by Ricardo on behalf of the Local Authority. The assessment demonstrated that the proposal would not give rise to any significant effects due to construction traffic, to fine particles (PM10) within the air quality management area; would have no significant impacts on human receptors; would have no significant effects on the local ecology; and would not lead to any breaches of any pollution standards for local properties. Further information can be found on the planning portal.

3.5 Planned Proactive Monitoring

3.5.1 Vortex

NPT are currently undertaking a pilot study to test the concept of localised air pollution monitoring. It forms part of the Swansea Bay City Deal project called 'Supporting Innovation and Low Carbon Growth', led by NPT Council. It is delivered as part of the council's Decarbonisation and Renewable Energy (DARE) Strategy.

The aim of the pilot study is to achieve a better understanding of air quality on a local level by using digital technology. Sensors are located in; Margam; Taibach; Aberavon;

Sandfields and Baglan Energy Park. The area will act as a test bed for the technology and will provide real time data on how air quality varies between different neighbourhoods.

NPT are collaborating with a local company Vortex IoT who have developed this innovative technology. Vortex IoT provide the sensors, wireless network and maintenance support. It is the first project of this kind in Wales.

The project is hoped to help the council more effectively target interventions, identify any pollution hotspots and pollution sources that were previously hidden and help it improve air quality and health outcomes.

The results of the study will be released on completion of the pilot project which is due to run for 3 years.

3.5.2 Short Term Operating Reserve (STOR) at Afan Way

In May 2021 concerns were raised about the local Air Quality near the Short-Term Operating Reserve (STOR) at Afan Way. Although the air quality modelling data for the facility suggested it would not give rise to any breach of Air Quality objectives, there was an ask for Environmental Health to undertake local air quality monitoring for Nitrogen Dioxide (NO_2) and Carbon Monoxide (CO). NPT has commenced a 12-month study using real time data from 3 of the Vortex sensors and a number of diffusion tubes located at various locations circulating the STOR and at nearby residential receptors. Unfortunately, there was not a low-cost option for monitoring CO and therefore the decision was made to focus on NO_2. Results for 2023 are presented in Table 3-1, showing the raw data for January to December 2023, an annual mean of data collected, and the bias adjusted mean for this period. The Local Bias adjustment factor of 0.63 has been used (see calculation methodology in Appendix C).

In 2023, the maximum annual mean NO_2 concentration at any site was at Neath/23A/NA1S15 (Afan Way Crossing) (24 µg m^{-3}), which is significantly below the NO_2 AQO of 40 µg m^{-3}.

Table 3-1 – Interim STOR Diffusion Tube Monitoring Results for 2023

Diffusion Tube ID	Site Name	NO_2 Monthly Concentration Data (µg m^{-3})												Interim Mean (µg m^{-3})	
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.63)
Neath/23A/NA1S3	25 Endeavour Close	18.8	9.4	-	-	-	4.7	9.2	-	8.9	11.8	15	-	11.1	7.0
Neath/23A/NA1S25	25 Endevour Close	23.3	18.6	20.2	14.9	14.7	14.9	14	-	18.7	18.5	16.7	18.3	17.5	11.0
Neath/23A/NA1S4	181 Victoria Rd	23.5	13.4	19	16.9	15.5	10.7	11.3	-	12.8	12.5	20.3	-	15.6	9.8
Neath/23A/NA1S2	Baglan Way	29.6	15.9	20.4	19.3	17.9	11.7	16.6	-	17.7	17.8	21.6	22	19.1	12.1
Neath/23A/NA1S16	8 Ysguthan Rd	30.8	20.8	26.7	20.7	20.8	15.5	18.6	-	20.1	19.1	27.4	25.2	22.3	14.1
Neath/23A/NA1S20	18 Talbot Road	23.4	22.4	59.7	19.2	20.1	16	16.4	-	19.7	24.8	25.2	22.3	24.5	15.4
Neath/23A/NA1S1	Village Rd.	28.1	15.4	19.1	16.7	13.4	11.6	13.5	-	15.6	16.1	22.4	18.9	17.3	10.9
Neath/23A/NA1S24	11 Dyffryn Road	22.5	-	-	-	1.2	10.9	12.6	-	18.5	19.1	21.6	-	15.2	9.6
Neath/23A/NA1S6	3 Harvey Cres		12	15.4	13.4	11.1	7.7	8.1	-	10.9	13.3	14.8	13.1	12.0	7.5
Neath/23A/NA1S12	30 Heshaw St	-	-	-	16.4	15.2		15.5	-	18.4		20.3	14.9	16.8	10.6
Neath/23A/NA1S18	Rd Afan Way	27.6	15.5	25.3	21.6	17.9	9	13.5	-	15.5	20.6	25.4	-	19.2	12.1
Neath/23A/NA1S5	81 Newbridge Rd	18.2	11.6	15.7	12	11.3	8	10.2	-	10.8	12	17.4	-	12.7	8.0

Diffusion Tube ID	Site Name	NO_2 Monthly Concentration Data (µg m^{-3})												Interim Mean (µg m^{-3})	
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.63)
Neath/23A/NA1S19	75 Talbot Road	32.5	1.1	32.3	26.9	24.2	20.2	20.4	-	26.6	24.2	22.2	27.5	23.5	14.8
Neath/23A/NA1S7	32 Harvey Cres	-	10.7	12.8	12.1	11.6	7.8	9.1	-	10.1	12.5	17.7	11.8	11.6	7.3
Neath/23A/NA1S8	Lamp Post Near Harvey Cres	18.8	12.3	12.1	13.4	11.7	6.9	8.9	-	9.4	9.8	11.4	10.6	11.4	7.2
Neath/23A/NA1S10	Jubilee Hse	35.6	23	32.7	24.4	29.5	16.3	20.6	-	19.9	24.7	30.7	26.5	25.8	16.3
Neath/23A/NA1S9	2 Victoria Rd	31.7	25.4	30	22.3	-	19.8	22.4	-	24.9	27.1	26.5	25.7	25.6	16.1
Neath/23A/NA1S11	Station Tce / Lady Lane St	22.8	17.2	-	15.9	13.9	11.8	12.4	-	-	17.8	21.3	-	16.6	10.5
Neath/23A/NA1S14	Afan Way Crossing	47.7	37.1	48.3	38.8	42	27.9	30.3	-	37.8	31.8	39.7	38.5	38.2	24.0
Neath/23A/NA1S15	Afan Way Roadside	45.1	29.6	35.7	30.9	34.3	33	30.4	-	31.2	25	33.6	32.4	32.8	20.7
Neath/23A/NA1S13	Cycle Path to Afan Way (1 Glenaton St)	28.8	20.7	19.5	18.5	16.7	15.4	15.1	-	20.1	19.9	24.8	19.1	19.9	12.5

4 Policies and Strategies Affecting Airborne Pollution

The Council's air quality strategy (AirWise) was first drawn up in 2000 and was subsequently revised in 2006 and 2013.

Progress being taken towards implementation of the strategy is contained within strategy document.

4.1 Local / Regional Air Quality Strategy

NPT adopted the Local Development Plan (LDP) on 27th January 2016. The extract below captures all relevant policies in respect of air quality / pollution, namely:

- Strategic Policy SP16 – Environmental Protection;
- Policy EN8 – Pollution and Land Stability; and
- Policy EN9 – Developments in the Central Port Talbot Area.

Subsequently in October 2016, NPT adopted a number of Supplementary Planning Guidance (SPG) documents to support the LDP, which set out more detailed topic or site-specific guidance on the way in which the policies of the LDP will be applied in particular circumstances or areas. Supplementing the three LDP policies referred to above, the 'Pollution' SPG provides detailed information about pollution issues in NPT and sets out the relevant matters that will need to be taken into consideration when developments are being planned. While only policies in the LDP have special status in the determination of planning applications, the SPG will be taken into account as a material consideration in the decision-making process.

NPT are in the process of creating a new LDP and one part of the consultation has now closed but there is more ongoing. More information is available at: https://www.npt.gov.uk/29462.

4.2 Local Transport Plans and Strategies

The Regional Transport Plan is the result of joint working between the four local authorities (Carmarthenshire, Neath Port Talbot, Swansea and Pembrokeshire) in southwest Wales. It replaces the individual local transport plans previously adopted by the four councils. As well as acting as a bidding document for major transport schemes it will shape transport policy in the region for the period 2016 -2021 and beyond. Details can be found on the Council's website.

4.3 Active Travel Plans and Strategies

NPT's Active Travel information can be found on their website. This includes the existing route map (ERM) and the Integrated Network Map (INM).

4.4 Local Authorities Well-being Objectives

The Environmental Health team address the wider determinants of health, which is the basis of the Act, and as such deals with a number of issues either directly or indirectly that contribute to the goals set out in the Well-being of Future Generations Act. For example: accumulations of rubbish and pest control; air quality strategy, monitoring and regulation; commercial and industrial pollution control; contaminated land strategy and regulation; dampness in housing; derelict houses and unsightly land; domestic air pollution control (garden fires/bonfires); health and safety regulation in Local Authority enforced businesses; health and safety regulation in houses in multiple occupation (HMOs); housing health and safety rating system in private rented accommodation; illegal eviction and harassment; industrial and commercial noise; neighbour nuisance and antisocial behaviour; planning consultations; public health protection and health promotion (sunbeds, tattooing etc); smoking ban and smoke free legislation; water quality.

4.5 Green Infrastructure Plans and Strategies

NPT is taking a more strategic approach to the management, enhancement and creation of Green Infrastructure, for the benefit of people and wildlife. Funding was secured from Welsh Government from the GI Capital Fund in 2018 to develop GI opportunity and demand maps, and deliver a demonstration project, whilst funding for further implementation was secured as part of the ENRaW (Enabling Natural Resources and Well-being) WG fund for 2019/20. As part of this grant, over 6000 saplings were planted and 160 large standards were planted throughout the county borough, in schools and urban locations, including the Port Talbot area.

An update is being awaited on further funding that has been sought from a second ENRaW application, for the period from April 2020 until March 2023. This funding bid was successful with funding received in September 2021 after significant delays. This provided the opportunity to further deliver GI intervention in Neath Port Talbot.

4.6 Climate Change Strategies

NPT has endorsed a Decarbonisation and Renewable Energy Strategy, which is available via their website.

5 Conclusion and Proposed Actions

5.1 Conclusions from New Monitoring Data

During 2023, the annual mean NO_2 concentrations at all monitoring sites complied with the AQS objective. Annual mean NO_2 concentrations at all sites decreased over the last five years, except for a slight increase between 2020 and 2021. It is thought that a greater than expected decrease in concentrations in 2020 is due to the COVID-19 lockdown and restrictions and the subsequent increase in 2021 is due to easing of these restrictions. Concentrations fell by around 8% between 2022 and 2023.

There were no exceedances of the annual mean AQS objective for PM_{10} (40 µg m^{-3}). Annual mean PM_{10} concentrations slightly increased at all sites in 2023.

There was an exceedance of the 24-hour PM_{10} objective at Prince Street 2 monitoring station, with 45 days exceeding a 24-hour mean above 50 µg m^{-3}. This exceeds the limit of 35 days. Though other sites were compliant, exceedances at the Margam (Fire Station) site increased from 23 in 2022 to 31 days in 2023. Exceedances increased at the other two sites within the AQMA: three exceedances were measured at Dyffryn School, an increase from two in 2022; and nine were recorded at Little Warren, an increase from six the previous year.

5.2 Conclusions relating to New Local Developments

Ongoing implementation and development of local strategies will continue to assist in reducing pollution 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.

5.3 Other Conclusions

Fine particulates of less than 2.5 microns in size ($PM_{2.5}$) were present in very low concentrations during 2023 and complied with the EU Target value (25 µg m^{-3}) and the WHO Interim Target 4 (10 µg m^{-3}). There is a highly significant downward trend in $PM_{2.5}$ concentrations at one long-term measurement site over the last 14 years.

Ozone is not covered by Local Air Quality Management because trans-boundary pollution can have a significant effect upon local results. The Air Quality Standards objective for O_3

is 100 µg m^{-3}, measured as a rolling 8-hour average, which is not to be exceeded more than 10 times a year. The Port Talbot Margam Fire Station site measured concentrations greater than 100 µg m^{-3} on 12 occasions during 2023, exceeding the permitted number. In 2020 and 2022, the number of exceedances were also greater than the permitted number. There is a stable trend in ozone concentrations at one long-term measurement site over the last 14 years.

The concentration of polyaromatic hydrocarbons at Port Talbot continues to exceed the Air Quality Objective of 0.25 ng m^{-3} at Port Talbot Margam. The newly installed analyser at Margam Youth Centre recorded an annual mean B[a]P concentration of 1.2 ng m^{-3}, exceeding both the Air Quality Objective and EU target value of 1 ng m^{-3}

Arsenic, Lead and Cadmium easily comply with the EU Target. Nickel concentrations exceeded the EU Directive's Lower Assessment Threshold value of 10 ng m^{-3}. The maximum weekly concentration observed was 71 ng m^{-3} (355 % of the Target Value). The Council will continue with enhanced regulation of Wall Colmonoy with the emphasis being on maintenance procedures.

5.4 Proposed Actions

1. NPT will continue to actively monitor pollutant concentrations, reviewing the monitoring network where necessary.
2. NPT will be producing an updated Air Quality Action Plan.
3. NPT will participate in the current Short Term Action Plan and participate in relevant meetings as detailed in the plan.
4. NPT will not be revoking the AQMA in the short term and will be assessing the impact of the points detailed in section 1.2.
5. NPT will contribute to the review of the Short-Term Action Plan.
6. NPT will liaise closely with Wall Colmonoy to prevent exceedances of the nickel target.
7. NPT will review new planning applications with particular attention to any likely to have an impact on the AQMA.
8. NPT will continue with its 3-year Vortex Air Quality Pilot Study.

References

- Decarbonisation and Renewable Energy Strategy (DARE)
- Joint Transport Plan for Southwest Wales 2016 – 2021
- Local Air Quality Management in Wales. Policy Guidance June 2017
- Mid and West Wales Air Quality: A Guide for Developers (2012)
- Neath Port Talbot Air Quality Action Plan 2012
- Neath Port Talbot Borough Council's Annual Progress Report 2022
- Neath Port Talbot CBC Local Development Plan (2011-2026)
- Neath Port Talbot's Local Air Quality Strategy, "Air Wise - clean air for everyone"
- Part IV of the Environment Act 1995 as amended by the Environment Act 2021, Local Air Quality Management, Technical Guidance LAQM.TG(22)
- Supplementary Planning Guidance
- Welsh Air Quality Forum data downloads
- World Health Organization. (2021). WHO global air quality guidelines: particulate matter ($PM_{2.5}$ and PM_{10}), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide. World Health Organization. https://apps.who.int/iris/handle/10665/345329 License: CC BY-NC-SA 3.0 IGO

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 2023 (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)
1a	44.9	45.1	34.6	37.9	37.5	35.5	36.8	40.8	33.4	38.2	46.6		39	25.7	
1b	56.5	45.8	36.1	37.8	39.2	37.2	36.6	42	30.1	36.2	42.2				
1c	53.7	43.6	38.5	37.5	35.9	33.8	36.2	42.7	33.2	39.1	46.3				
4	28	36.3	34.7	27.4	24.7	21	22.3	26.6		46.5	32.3	33.9	30.5	20.1	
5	48.5	35.8	27.9	29.5	28.5	26.2	27.3	29.6					31.1	20.6	
7a	29	26.4	26	28.3	27.5	25.8	24.4	28.7	23.4	26.7	36.5	27.6	27.5	18.1	
7b	42.3	33	31.4	27	26.2	25.3	27.5	28	24.5	30	36.8	30.6			
7c	43.2	30.3	31.3	27.9	24.7	24.3	27	29.2	17.5	29.5	35.8	35.4			
8	44.6			28.3	26.3	24.3	25.3	28	21.4	26.9	34.1	32.2	28.7	18.9	
9	43.4	34.8	31.5	28.8	25.8	24.5	22.1	28.2	21.6	57.7		33.4	32	21	
10	43.5	33.3	31.7	27.6	25.5	24.4	24.5	29.2	23.7	24.6	35.2	27.2	28.7	18.9	
11	39.4	32.2	28.5	25.6	24.4	23.9	24.6	26.6	22.3	29.9	35	29	28.2	18.5	
12	47.8		29.7	28.8	27	25	25.8	29.1	25.9	27	35.3	32.2	29.9	19.7	
13	44.3	27.5	26.1	57.4		21.1	24.1	27.5	24.6	23.1	33.3	31.5	30.6	20.1	
14	41.7	34.7	27.6	60.6	31.5	25.6	27.5	29.1	25.7	28.4	34.4	33.5	33.1	21.7	
15	47.6		29.7	27.2	27.4	25.4	27.7	31.1	26.9	25.8	37.9	35.7	30.7	20.2	
16	47.1	37.9	28.8	31.1	34.4	31.1	28.9	64.1		33.5			36.9	24.3	
17	50.8	41.4	40.5	33		28.4	26.4	36.5	31.7	26.5	43.4	42.9	36.2	23.8	
18a	42.6			38.7	39	38.3	32.1	35.4			42.7	33.3	37.6	24	
18b	48.6	42.1	41.1	35.9	38.1	33.6	31	34		39	47.2	97			
18c	47.7		40.3	36.9	39.9	33	33	37.6			44.4	34.7			
19a	26.4	20.3	16.1	13.4	13.6	14.2	12.8	13.5	12.8	21.1	29.9	22.1	17.9	11.8	
19b	24.7	20	14.6	11.9	12.8	13.6	12.1	12.7	11.5	18.4	30.6	24.6			
19c	26.2	21.3	25.4	14	14.7	14.1	12.3	12.5	11.7	20.1	25.8	22.7			
20a	45.4	39.2	31.7	30.4	33.7	30.5	31.5	34.9	28.3	33.9	41.2		34.4	22.6	
20b	43.7	32.6	32.5	33.1	35.5	32.5	31.7	34.6	29.9	31.5	39.1	38.2			
20c	43.2	37.5	28.1	31.7	33.1	32.5	31.7	35.9	29.4	32.7	38.1	34.3			
21	45.9	47.1	36.8	38.8	36.1	36	36.6						39.3	25.8	
22	39.1	29.5	24	22.8	20.6	18.2	19	21	19.7	23.3	27.8	31.2	24.4	16.1	
23	39.1		35.9	29.6	26	21	24.5	30.1	26.4	25.1	33.1	34	29.2	19.2	

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table A.1**.

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☒ **Local bias adjustment factor used.**

☐ **National bias adjustment factor used.**

☒ **Where applicable, data has been distance corrected for relevant exposure in the final column.**

☒ **Neath Port Talbot County Borough Council confirm that all 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

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**.

See Appendix C for details on bias adjustment and annualisation.

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

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

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

Appendix C: Air Quality Monitoring Data QA/QC

QA/QC of Diffusion Tube Monitoring

NO_2 diffusion tubes are sourced from the Environmental Scientifics Group Socotec and are prepared using the 50% Acetone TEA in Acetone Method.

Defra has provided a spreadsheet to facilitate the calculation of local bias adjustment factors. The National Bias Adjustment Factor Spreadsheet can be found on the LAQM Support Website.

Diffusion Tube Annualisation

Annualisation was necessary for six sites (DT8, DT9, DT10, DT11, DT14 & DT23) during 2023 due to data capture of less than 75%. Data from four background sites (Swansea Roadside, Cardiff Centre, Cardiff Newport Road and Newport) were used to conduct the annualisation (Table C.1).

Table C.1 – Annualisation Summary (concentrations presented in µg m^{-3})

Site ID	Annualisation Factor Swansea Roadside	Annualisation Factor Cardiff Centre	Annualisation Factor Newport Road	Annualisation Factor Newport	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
8	1.0789	1.0995	1.0914	1.1112	1.0953	26.1	28.5
9	1.0784	1.1143	1.0851	1.0995	1.0943	25.3	27.7
10	0.9413	0.9748	0.9410	0.9623	0.9548	25.4	24.3
11	1.0789	1.0995	1.0914	1.1112	1.0953	26.3	28.8
14	1.0514	1.0979	1.0676	1.0770	1.0735	26.2	28.1
23	0.8371	0.7958	0.8221	0.8214	0.8191	29.4	24.1

Diffusion Tube Bias Adjustment Factors

NPT have applied a local bias adjustment factor of 0.63 to the 2023 monitoring data (the average of two local studies - Table C.2). The national bias adjustment factor of 0.78 was not used as the local bias adjustment had good overall precision and good overall data capture.

Table C.2 – Local Bias Adjustment Calculations

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2
Periods used to calculate bias	9	8
Bias Factor A	0.57 (0.47 - 0.73)	0.7 (0.63 - 0.78)
Bias Factor B	76% (37% - 114%)	44% (29% - 58%)
Diffusion Tube Mean (µg m^{-3})	43.3	16.6
Mean CV (Precision)	4.1%	4.0%
Automatic Mean (µg m^{-3})	24.7	11.5
Data Capture	100%	96%
Adjusted Tube Mean (µg m^{-3})	25 (20 – 32)	12 (10 - 13)

Notes: An average local bias adjustment factor of 0.63 has been used to bias adjust the 2023 diffusion tube results.

A summary of bias adjustment factors used by NPT over the past five years is presented in Table C.3.

Table C.3 – Bias Adjustment Factors Applied in the Last 5 Years

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2023	Local	-	0.63
2022	Local	-	0.66
2021	National	06/22	0.78
2020	National	06/21	0.76
2019	National	09/20	0.75

NO_2 Fall-off with Distance from the Road

No diffusion tube NO_2 monitoring locations within NPT required distance correction during 2023.

QA/QC of Automatic Monitoring

The AURN site is subject to the quality control procedures of the network. NPT Council staff act as Local Site Operator, carrying out calibrations on an approximately fortnightly basis. There are regular site audits and validation, and ratification are carried out by AURN staff prior to dissemination of the data via UK Air. All equipment is covered by service and maintenance contracts with suppliers. These contracts provide for 6-monthly servicing and emergency callouts.

Monitoring stations are covered by a QA/QC contract with Ricardo which provides for two site audits per year and QA/QC of the data which is polled by Ricardo and disseminated on the Welsh Air Quality Forum website. Data is subject to a similar QA/QC standard as the AURN.

PM_{10} and $PM_{2.5}$ Monitoring Adjustment

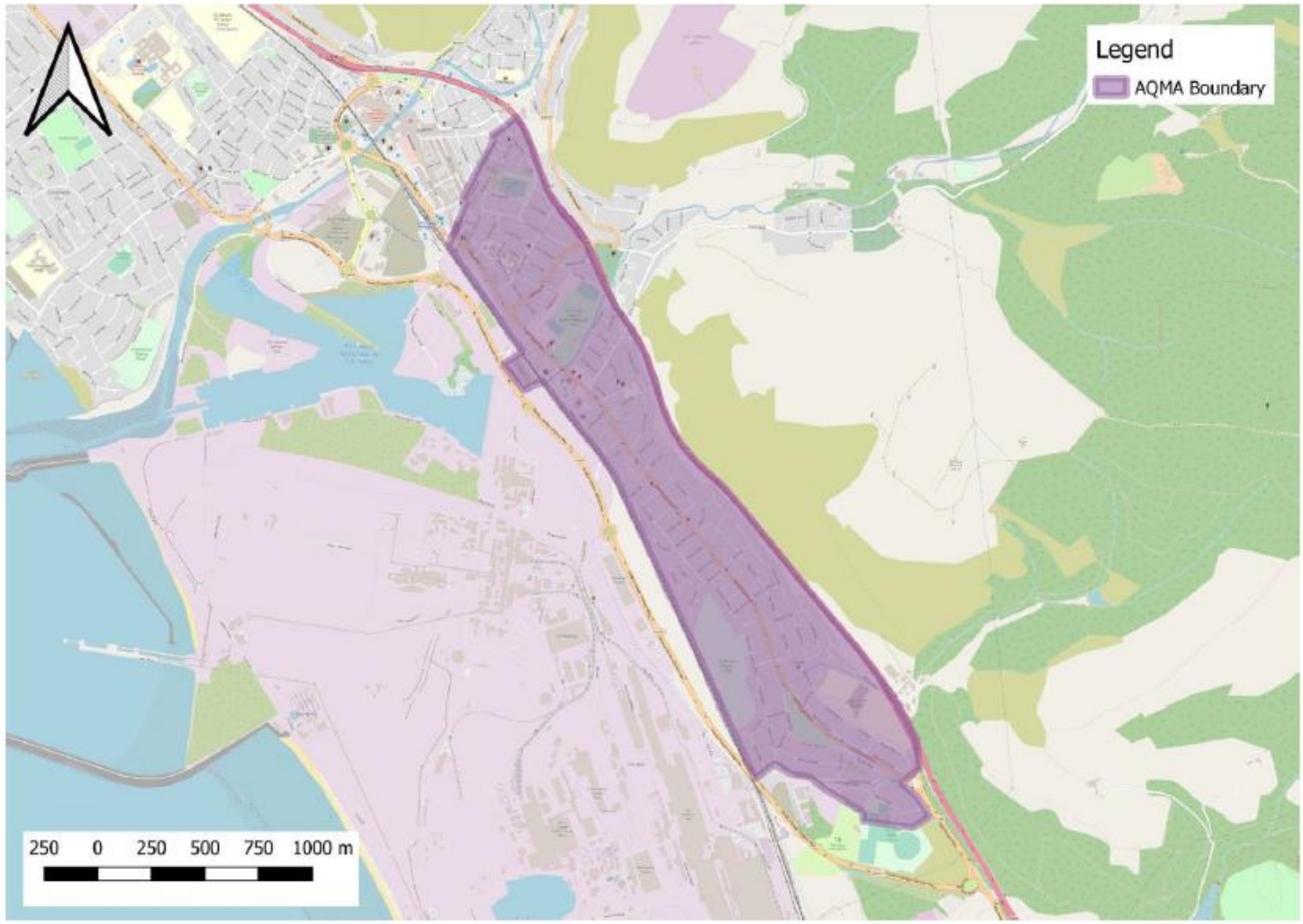
The Smart Heated BAM PM_{10} data are corrected by dividing by 1.035 for gravimetric equivalence. The $PM_{2.5}$ Smart Heated BAM data do not require any correction for equivalence.

Automatic Monitoring Annualisation

All automatic monitoring locations within Neath Port Talbot County Borough 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.

Appendix D: AQMA Boundary Maps

Figure D.1 – Taibach/Margam 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
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